



ATLANTIC TERRA COTTA

The Flashing
of Terra Cotta

VOLUME • VII • • MCM XXIV • NUMBER • 1 •

Waterproofing As Important as Fireproofing

Flashing is equally important for all structural materials.

Flashing equals fireproofing in importance. Both make for building permanence.

The theory of flashing is that cornices, parapets, balustrades and free standing members should be protected from the penetration of water that might collect and freeze, or that might get into the walls and seep through, damaging the interior of the building.

Modern practice is to protect the surface with adequate flashing, and, as an additional safeguard, to provide a way for the escape of water that might penetrate in spite of all precautions.

Exterior building materials are in general waterproof; the danger lies in the joints, which demand constant attention if not protected with a permanent, waterproof cover.

The problems of flashing are not difficult, nor is the installation expensive if it is done at the time the building is erected.

When it is realized that water, alone or combined with frost, is the strongest agent of deterioration in the structural field, the value of correct flashing is appreciated.

This issue of ATLANTIC TERRA COTTA is practically a text book on the Flashing of Terra Cotta, the only one ever printed. The principles in general hold true for every building material.

The information is chiefly the result of our own researches. We are indebted to the Copper & Brass Research Association for permission to reprint certain features that first appeared in their recently issued hand book "Copper Flashings."

The information may be considered authoritative.

Weep Holes 6000 Years Ago

By introducing weep holes in Atlantic Terra Cotta Construction we follow a practice that has stood a test of sixty centuries.

Recent excavations in Mesopotamia conducted by the Museum of the University of Pennsylvania have cleared a great brick tower erected 6000 years ago, known to be similar in appearance, size and construction to the Tower of Babel.

Major Woolley's report describes this imposing tower in some detail. We quote his report in part:

"The quality of the brick and of the bricklaying is astonishingly good and much of the wall face is as clean and new looking as when built. The surface is relieved by shallow buttresses; a further variety is afforded by the numerous 'weeper holes' running through the thickness of the burnt brick wall for a drainage of the filling, which without this precaution would have swelled with the infiltration of the winter rains and burst the casing."

ATLANTIC TERRA COTTA

PRINTED MONTHLY FOR ARCHITECTS



New York City's Terra Cotta Line



Atlantic Terra Cotta Company

350 Madison Avenue, New York

Atlanta Terra Cotta Company

Atlanta, Georgia

Largest Manufacturers of Terra Cotta in the World.

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Plate I—Atlantic Terra Cotta

New York City Skyline

Architecture has done much for the New York City skyline. The forest of tanks in the foreground was typical of the entire city not many years ago. The new city in the background is a vision realized—realized for the greater part in Atlantic Terra Cotta.

ATLANTIC TERRA COTTA

VOL. VII

JUNE, 1924

No. 1

Publication of ATLANTIC TERRA COTTA will be suspended in July and August. No. 2 of Vol. VII will appear in September

Keeping Buildings Dry

By Engineer of Standards, Atlantic Terra Cotta Company

THERE is no doubt that in the past the importance of flashing in building construction has not been fully recognized. It has long been the custom to flash gutters and to use flashing at the junction of roofs and parapets, but it is only recently that designers and owners of buildings have begun to realize the necessity for flashing the entire upper and rear surfaces of exposed architectural features. It is now becoming evident that more attention must be paid to the protection of parapets and copings, the top of cornices and the floors of balconies.

An extensive examination of buildings erected in the last thirty years shows conclusively that the saturation of cornices and parapets is a very prevalent condition. In some cases the water enters at the mortar joints in the top of the coping. In other cases rain beats in and soaks in at the joints in the back of the parapet wall. Very frequently the mortar joints in the wash of the cornice are so cracked and porous that a lot of the water that runs down the parapet or falls on the top of the cornice finds its way into the interior of the wall.

Many architects and owners find that they have been placing too much reliance on the mortar joints. Having procured weatherproof building materials, such as Terra Cotta or hard stone, and having specified mortar of tested ingredients and approved mixture, they supposed that their buildings would be water-tight when erected. They are now finding that a great many buildings are not water-tight and on searching for the cause, they usually discover that the water is getting in at the mortar joints in the wash of the cornice and parapet coping.

At a first glance it might appear that by carefully caulking or grouting the joints in the wash of cornices, parapets and balconies, it should not be very difficult to make them water-tight, but the present condition of a great many of these features proves that for one reason or

another, water-tight joints are not being obtained. The bad condition of the mortar joints may be attributed to a variety of reasons, as for instance, poor workmanship, poor mortar, disintegration by frost, or cracking of joints due to thermal expansion and uneven settlement.

Many kinds of elastic cement and various caulking compounds for the protection of mortar joints are on the market and some of them remain impervious and somewhat elastic for several years but none of them appears to retain its original qualities indefinitely. Protection by means of caulking compounds involves periodical examination and considerable maintenance.

The results of poor joints are far reaching. The most common visible damage due to leaky joints in washes is unsightly staining and streaking on the face of the building. This staining and streaking is often extensive enough to destroy the beauty of a costly building. Frequently the streaks and discolorations clearly indicate that soluble portions of the mortar are seeping out at the beds and joints and are being deposited on the face of the building. Such a condition as this, if allowed to continue, will rapidly bring about the disintegration of portions of buildings on which it occurs.

Another serious result of leakage at joints is damage to plaster ceilings and walls within the building. Cases have been known where water entering at leaky joints in the washes of cornices and parapets has penetrated the walls to the depth of several stories below, causing considerable damage to the paint and plaster on the inside of the walls.

A still more serious condition, worse because it is out of sight, is the effect of dampness on steel framework within cornices, balconies and balustrades. The presence of moisture leads to rapid corrosion of the steel members and may eventually render projecting features unsafe.

Architects and owners of buildings have also to consider the damage that is caused by the freezing of water that collects in pockets and open spaces in the interior of walls and structural features. The expansion of ice repeated through a number of winters may finally rupture the masonry.

As impervious joints are difficult to obtain and expensive to maintain and as neglected leaks result in damage to valuable buildings, it is advisable to cover wash surfaces with an impervious and permanent covering. Sheet copper is believed to be a suitable material for this purpose.

Flashing should be carried entirely over the top of cornices and in most cases should be turned down over the nib far enough to form a drip and allow the water that runs down the wash to fall clear of the moldings. In this way the face of cornices may be kept clean and free from stains of any kind. When the top of a cornice is flashed, it is advisable to carry the flashing entirely through the base of the parapet and connect it with the cap flashing at the back of the wall. In this way water which enters at the top of the parapet is prevented from getting down behind the flashing at the back of the wall and is also prevented from getting underneath the flashing on the top of the cornice. The backs of parapets should be flashed whenever possible and the flashing should be carried over the top of the wall, laying it in the bed joint immediately below the coping. Then, if there is any leakage at the joints in the wash of the coping, the water cannot get behind the flash-

ing, as it often does when the flashing is applied only to the back of the wall.

The unsightly discoloration that is so much in evidence on the underside of balconies indicates the necessity for better protection of these features. It is almost impossible to make the deck of a balcony water-tight by means of a cement or tile finish. A covering of sheet metal should be used in all cases. In flashing the tops of balcony slabs with sheet metal it is necessary to run the flashing out to the nib if the best results are to be obtained. Quite frequently the floor of a balcony is properly flashed, but the flashing terminates in raglets in the base of the balustrade. This practice almost invariably results in the saturation of the balcony slab by water which finds its way in at the joints in the balustrade and runs down behind and underneath the flashing. By carrying the flashing underneath the base course, any water that enters at the joints of the balustrade cannot penetrate to the balcony slab, and the soffit of the balcony is kept dry and unstained.

The washes of pediments and dormers should be completely flashed if staining and other evils of saturation are to be avoided.

While the use of sheet metal for the protection of mortar joints in washes may entail some slight additional expense at the time of the erection of the building, it will be found more economical in the end because the cost of maintenance will be avoided. Moreover, a building that is properly protected at the beginning will retain its original beauty and value.

Flashings for Terra Cotta

Reprinted from "Copper Flashings," a handbook published by the Copper & Brass Research Association, 25 Broadway, New York, N. Y.

In general all built-in flashings should be furnished by the sheet-metal contractor and should be placed by the mason setting the Terra Cotta. All built-in sheets should be shaped by the sheet-metal man to conform to the measurements furnished by the mason, and sufficient metal left to allow proper connection to the adjoining flashing. In effect these built-in flashings, in the majority of cases, are counter-flashings.

The best method of fastening flashings to the blocks is that shown in Figure 63. Holes for plugs about $\frac{3}{8}$ of an inch in diameter are formed in the Terra Cotta 8 or 9 inches apart. A small piece of sheet lead is rolled around a large nail, thus forming a hollow cylinder. This cylinder is inserted in the hole and a brass screw is turned through the copper into it. The lead fills the hole completely and makes a firm anchor for the screw.

Wooden plugs are not suitable, for in driving them into the holes there is danger, and dampness is liable to cause them to swell.

It will be noted from a study of the drawings, (Figures 59 to 66), that there is one principle, to make as complete a cut off as possible so that moisture driving in through open joints, etc., cannot work its way into the interior of the building. This idea should be borne in mind in designing Terra Cotta construction and in providing proper flashings.

Flashings for Terra Cotta should be as nearly as possible continuous and should be so placed as to provide a complete waterproofing of the interior.

Balconies, balustrades, rails, copings, etc., require keying to hold them in place. This key or dowel is shown in Figures 59, 61, 62, and 65. It is not easy to get the flashing material over this if it is made exactly to dimension as drawn. As it is quite necessary that the copper be well fitted so that the superimposed pieces shall have a good bearing, it is suggested that the key be made slightly rounded and be shaped with mortar to fit the flashing strip as much as possible.

While it is general practice to make the fas-

tenings of Terra Cotta of iron and steel, the use of brass and bronze for bars and anchors, and of copper wire is increasing. After the erection of Terra Cotta these members are concealed, inspection is impossible, joints open up, and dampness enters and rusts iron and steel fastenings. For the best work the hangers of all suspended Terra Cotta should be of non-ferrous metal, preferably bronze. While this adds somewhat to the cost of first installation, it insures a permanent job, requiring no further attention, because the elements will not rust the bronze and damage the work.

Attention is called to the following paragraphs from the Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta, published by the National Terra Cotta Society, September, 1923.

Preparation for Flashing

14.—Where so shown the washes of all projecting cornices and other exposed horizontal surfaces shall have provision made for flashing. All surfaces where the wash pitches inward toward

the structure and stops against superimposed work; all balcony floors, and all gutter grades shall have provision made for flashing.

15.—Raggles shall be provided to receive gutter linings and flashings when the joints can not be used for the purpose. Raggles shall be not less than $\frac{3}{4}$ inches deep.

Suggestions for Corollary Clauses

87.—In the case of parapet walls specifications should state that flashing if used shall be carried through the wall, or if flashing be not used the back of the parapet wall shall be damp-proofed and the water-proofing carried through the wall.

88-2.—In the specifications for sheet metal work there should be included a clause similar in purport to the following:

"The washes on all cornices and other exposed surfaces, where shown or specified, shall be covered with () which shall be turned up against vertical surfaces (cap flashed) and cemented into the raggles provided for the purpose in the Terra Cotta."

Section 75 of Standard Specification for Sheet-Copper Work

as published by Copper & Brass Research Association

WHERE indicated on the drawings Terra Cotta shall be flashed to make a water-tight job. The top surfaces of all projections, such as the washes of cornices, where the wash is formed of more than one piece, shall be completely flashed, and where so shown on the drawings all single deck projections shall be so flashed.

Flashings shall be secured to the outer edge of Terra Cotta projections by forming around a rolled nosing or bull-nose formed in the Terra Cotta, or by brass screws set with lead sleeves into holes formed in the Terra Cotta. The screws shall be set through washers and shall be soldered to the sheet. The sheet so secured shall extend down below the edge of the Terra Cotta not more than three-eighths of an inch to form a drip.

Cornices, band cornices, gutters, etc., formed in Terra Cotta, or masonry faced with Terra Cotta, shall have a continuous flashing running from the outside edge up to and behind the cap flashings.

Cap flashings shall be built in behind the Terra Cotta facing above all cornices, etc. They shall extend up the wall at least one course of Terra Cotta and shall lap the cornice flashing 4 inches. Where the design does not permit a 4-inch lap of base and cap flashings the lap shall be soldered.

Balconies with balustrades shall have continuous flashings running from under the door or window sills through the balustrades and to the outside edge of the projection. Flashings shall be formed with flat-locked or lapped seams well-soldered.

All flashings over 24 inches wide shall have a full-length longitudinal flat or double-locked seam secured by cleats.

Around column bases, etc., flashings shall be turned up and into a raglet formed in the Terra Cotta or into the first joint of the Terra Cotta facing in such a manner as to make a water-stop.

Where rods, etc., necessary to support Terra Cotta balustrades or other architectural members, penetrate the flashings, the joint shall be made water-tight as follows: The rods being in place, the flashing pieces shall be marked, punctured and set in position by sliding down over the rods; or, if this method is impracticable, the sheets may be slit to allow them to be slid into place. The slit shall be made tight by soldering a strip over it. Cups or thimbles, conforming roughly to shape of the rod or bar shall be then placed over the rods and soldered to the sheet. They shall be at least 1 inch bigger all around than the rods. The cups shall then be filled with mortar or an approved waterproofing-compound.

Reprinted from "Copper Flashings"



Plate II—Atlantic Terra Cotta

Main Cornice of Atlantic Terra Cotta

From a photograph of a flashed cornice constructed as detailed in Plate No. 6
on opposite page.

Atlantic Terra Cotta Construction

Construction and Flashing of Main Cornice

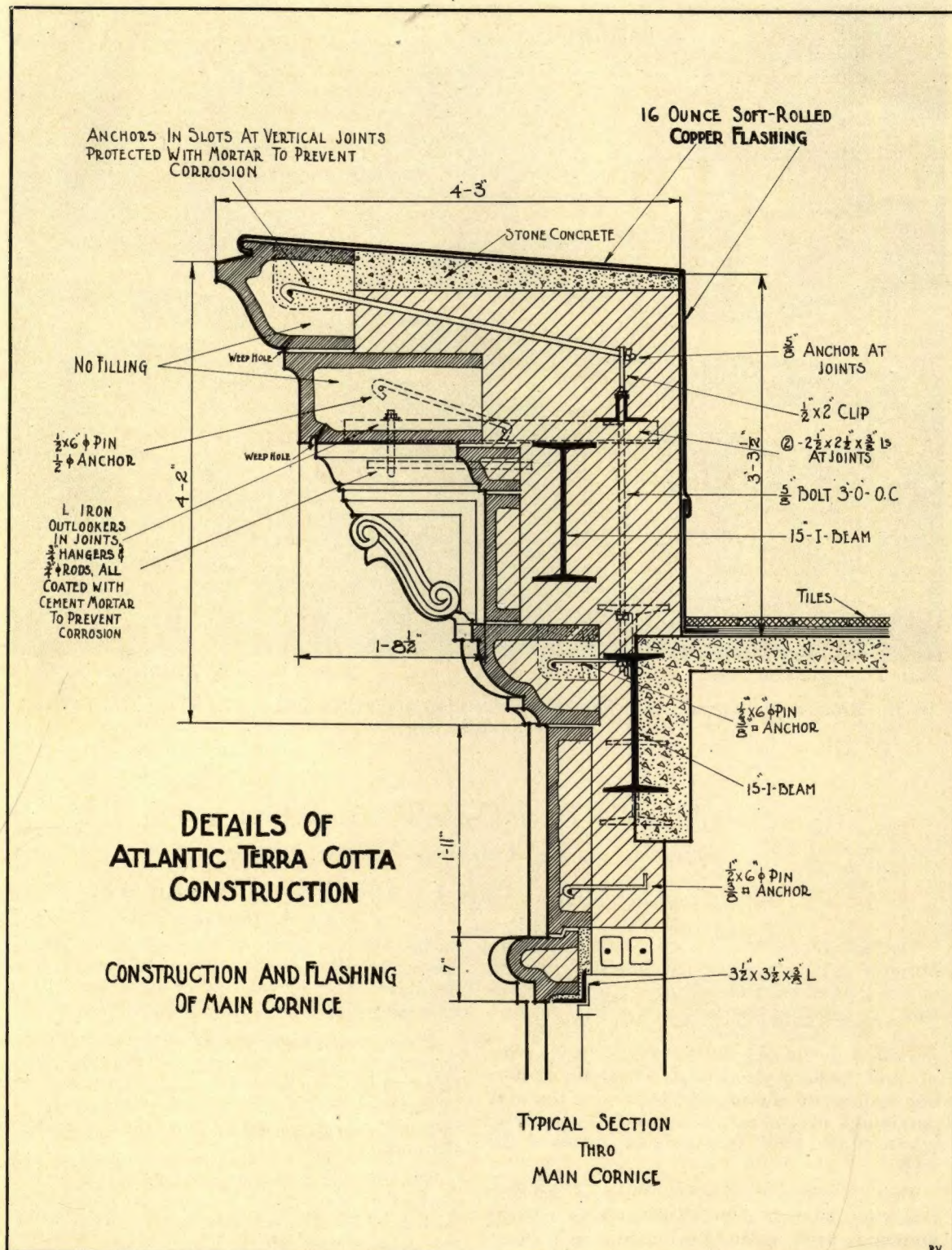
Plate 6

Plate No. 6 illustrates a main cornice properly protected. The wash and the back of the wall are both covered by the flashing. A cornice protected in this manner will remain in excellent condition indefinitely.

There is one point where a slight improvement might have been made in the construction. The front edge of the copper on the wash terminates in a raglet under a roll member a few inches behind the nib of the crown mould.

It would have been better to have carried the flashing out over the nib of the Terra Cotta, with a drip to prevent any water from running down the face of the cornice.

Some architects dislike the idea of having the nib of the crown member covered with metal but we believe that it is better to sacrifice this small architectural detail for the sake of the additional protection that is afforded by completely sheltering the entire cornice.



Atlantic Terra Cotta Construction

Construction and Flashing of Entrance Feature

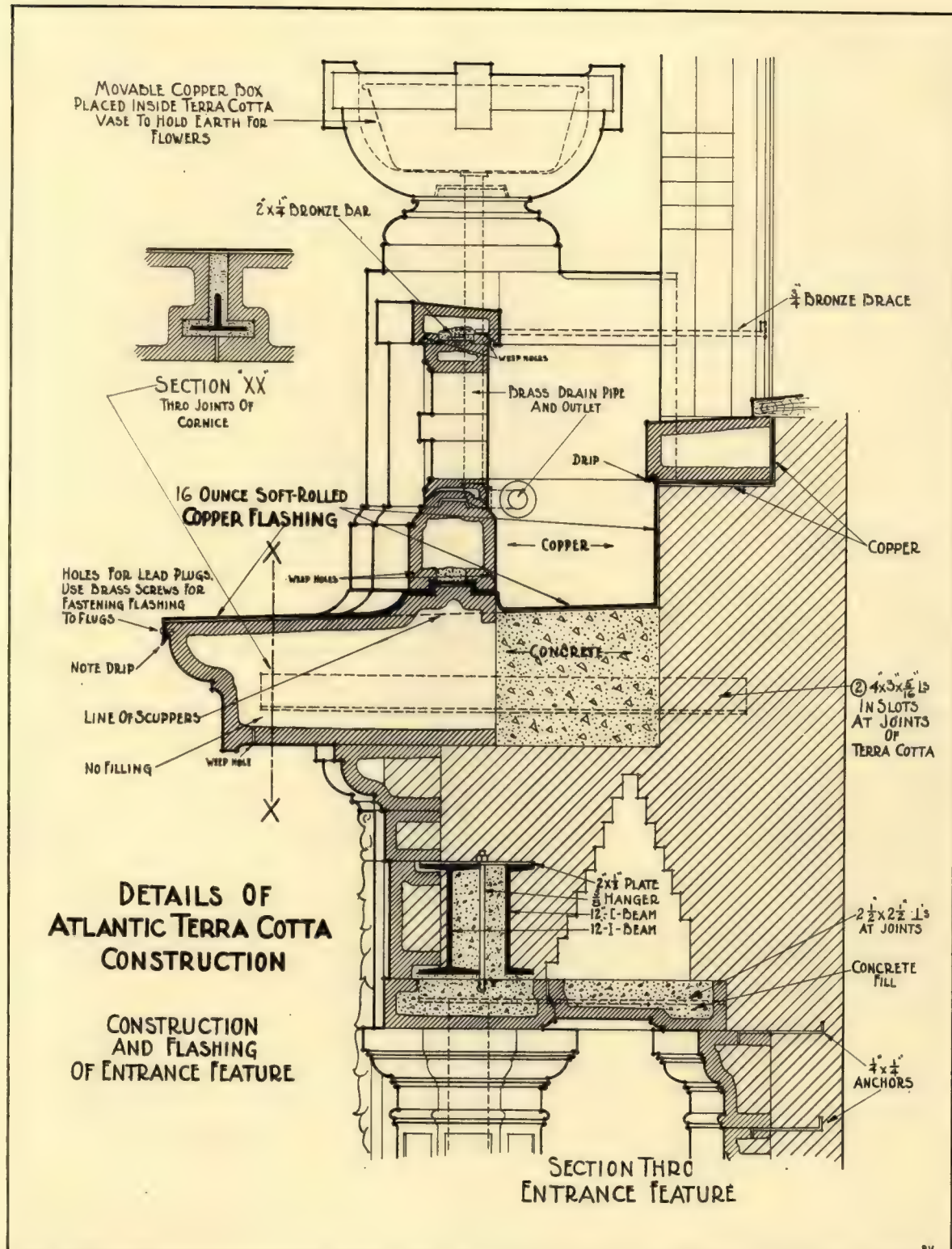
Plate 8

This drawing shows a very interesting case of flashing for the protection of an entrance feature. The flashing not only covers the top of the cornice, but is carried through the base of the balustrade and over the deck of the balcony. The flashing is also carried up the wall behind the balcony and under the window sill.

An arrangement of this kind protects a projecting feature excellently. It is practically impossible for water to get into the cornice or the soffit of the portico. If any water leaks in at the mortar joints in the balustrade, it cannot get down into the cornice, but must find its way out at the weep holes provided in the Terra Cotta or at the mortar bed where the balustrade is built on top of the flashing.

The metal stiffener in the hand-rail of the balustrade is of bronze, and the brace anchors which run from the ends of this bar into the main wall are also of bronze. The use of bronze in cases of this kind entails an expense of only a few dollars and it is an economy in the end. Iron bars and rods are likely to corrode unless they are very carefully encased in mortar.

The vases at the corners of the balustrade bring up an important point that is sometimes overlooked in designing work of this kind. It is not advisable to rely on the custodians of buildings to remove the earth from vases when winter approaches. There have been instances where damp earth freezing inside the bowl of vases has cracked them. To avoid this copper pans should be placed inside the bowls of the vases to contain the earth and plants. Then, in the Fall of the year, the pans can be lifted out. The brass outlet at the bottom of parapet vases should be of large diameter so that it is not readily blocked by ice or rubbish.



Flashing Details; Cornices, Balconies and Balustrades

For the following two plates and descriptions we are indebted to the Copper & Brass Research Association. The plates are intended to show correct and possible methods for flashing Terra Cotta, but the actual construction of the Terra Cotta should not be accepted as correct in every detail.

For example, the anchors are usually placed between two pieces of Terra Cotta in slots provided for the purpose, and are completely protected by cement mortar; they are not placed in the voids of the Terra Cotta.

Anchors should invariably be coated with cement mortar; it has not been possible to show this in every case.

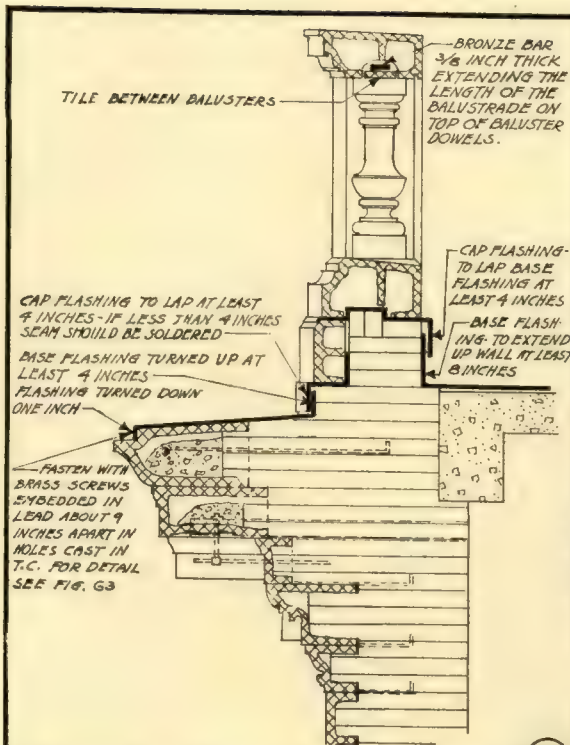
Fig. 59. One method of flashing a Terra Cotta cornice is shown in Fig. 59. The cap flashing on the outside of the balustrade and the flashing above it extending through the wall are both built in as the masonry progresses. Before laying the upper flashing a key is formed by the mason to avoid the chance of a side slip in the balustrade after erection. This key may be formed either by setting two bricks on edge or by the use of concrete; its exact size and location is decided by the design. The copper flashing should be formed closely over the projection in one piece and wide enough so that it can extend entirely through the wall and be turned down on the inside far enough to lap the base flashing at least 4 inches, and turned down outside about $\frac{1}{2}$ inch over the Terra Cotta to form a drip. The lower cap flashing, also built in with the masonry, turns up against the brick work back of the Terra Cotta at least 3 inches and down outside on the face of the wall far enough to lap the cornice flashing at least 4 inches. If the lap is to be soldered the distance may be reduced accordingly. The outer edge of the Terra Cotta cornice should be so designed as to provide a fastening for the outer edge of the copper base flashing covering the top of the cornice. (A good description of the method of fastening is given in Fig. 63.)

Attention is called to the use of the $\frac{3}{8}$ -inch thick bronze bar set in the top rail of the balustrade. This bar is continuous on top of the balusters, and if possible should be returned at the ends of the balustrade into the main wall of the building and anchored. The bar is placed on top of the balustrade dowels just before the Terra Cotta rail is placed in position.

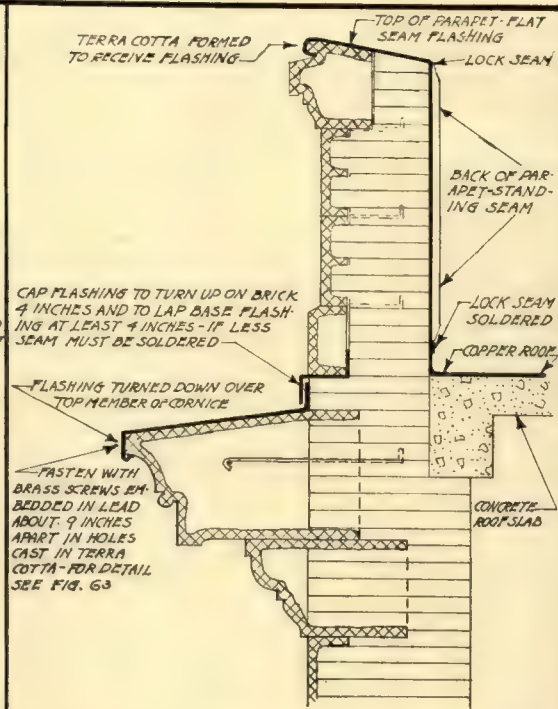
Fig. 60. A Terra Cotta cornice surmounted by a brick parapet-wall faced by Terra Cotta and the method of flashing same is shown in Fig. 60. In this type of construction it is important that the entire top and back of the wall be covered with copper. This will prevent the absorption of moisture by the masonry through the joints of the Terra Cotta and brick work and permit cutting down the width of the Terra Cotta cap. In designing the Terra Cotta cap the upper part of the cap should be made with a roll, as indicated, from 1 to $1\frac{1}{2}$ inches in diameter. The copper is formed over this roll and extended over the top of the cap and down on the inside of the parapet-wall where it is connected to the copper roof by a soldered

lock seam. The copper at the back of the parapet should be formed with standing seams and the top with flat seams soldered. The two are joined by a lock seam hammered flat. The top of the Terra Cotta cornice should also be covered with copper to protect the joints. The copper may be formed over the upper member of the cornice as shown or the cornice may be designed as shown in Fig. 59 and the copper formed over this step. In either case it is secured in place by screws as described in detail in Fig. 63. After securing the outer edge of the copper as above described the metal is brought back over the top of the cornice and turned up on the masonry. There it is held in place by the copper flashing turned down over it. For cornices with over 2 feet of projection it will be found expedient to form a soldered lock seam half way across the projection and lengthwise of the cornice. The cap flashing begins at the back of the Terra Cotta against the brick work and is turned up against the brick work 3 or more inches, then brought outside of the Terra Cotta and turned down, lapping the base flashing 4 inches. If the lap is soldered this distance may be reduced accordingly.

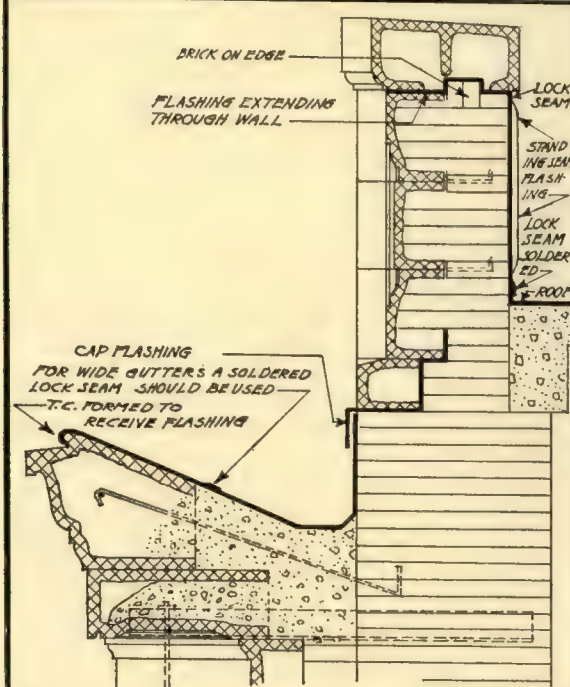
Fig. 61. Another method of forming a gutter in a Terra Cotta cornice surmounted by a brick parapet-wall faced with Terra Cotta is shown in Fig. 61. The flashing is continued through the wall beneath the Terra Cotta cap to prevent seepage and continues down on the inside of the parapet and is formed with vertical standing seams (see Fig. 60) and connected to the main roof copper by a soldered lock seam. Attention is called to the key formed in the masonry below the Terra Cotta cap which is made as described in detail in Fig. 59. The cornice flashing, forming also the gutter-lining, is formed on its outer edge over a Terra Cotta roll (as described in detail in Fig. 60) and extends back on the masonry, avoiding all sharp angles, to the brick wall where it is turned up on the wall high enough so that the top will be at least 3 inches above the highest part of the outside of the Terra Cotta cornice. For gutters over 2 feet wide a soldered lock seam should be formed longitudinally in the middle of gutter. This seam is secured by cleats nailed to wood strips set in the concrete. The cap flashing is laid at the back of the Terra Cotta facing of the parapet about 3 inches up on the wall, and extends out under the Terra Cotta



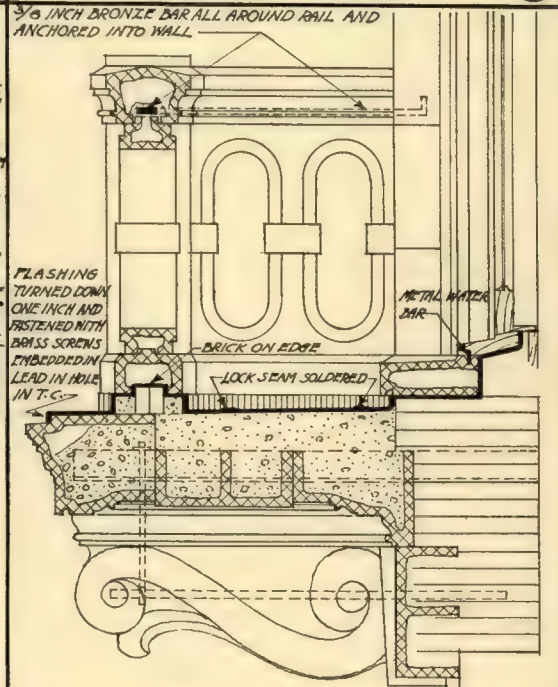
FLASHING FOR CORNICE WITH BALUSTRADE 59



FLASHING FOR CORNICE WITH PARAPET 60



FLASHING OF GUTTER OF TERRA COTTA CORNICE AND PARAPET 61



FLASHING OF FLOOR OF TERRA COTTA BALCONY AND METHOD OF SECURING RAIL 62

to the outside, where it is turned down 4 inches over the gutter-lining. If this lap is soldered the distance may be reduced accordingly.

Fig. 62. A balcony formed of Terra Cotta

with a rail of the same material and a window or door opening to it and the method of flashing is shown in Fig. 62. The copper is laid from the outside of the cornice (secured either by screws as illustrated and described in detail in

Fig. 63, or over a roll as described in Fig. 60), over a masonry key (described in Fig. 59), and across the floor of the balcony to the main walls, where it is turned up against the masonry and under the Terra Cotta and wood sills and up to the back of the wood sill. The introduction of one or more soldered lock seams will be necessary in the floor of the balcony, depending upon the width, and some provision should be made for copper-lined scuppers at such places and of such size as the design of the rail may permit. The bottom of the scuppers should always be about 2 inches above the highest point of the balcony floor. The flashing of the balcony floor should rise on all sides from 2 to 3 inches above the bottom of these scuppers. Attention is called to the copper water-bar (described in detail in Fig. 11) and the bronze bar in the balustrade rail (described in Fig. 59).

Fig. 63. A method of flashing a projecting Terra Cotta balcony enclosed by a metal rail with a door or window opening to it is shown in Fig. 63. Particular attention is called to the method of fastening the outer edge of the copper work to the Terra Cotta as shown in detail in the lower left-hand corner. When designing the Terra Cotta, provision should be made for a step $1\frac{1}{4}$ inches or more in height above the top molding. When the Terra Cotta is cast, and while it is still in a plastic state, a row of holes is punched in the face of this step about $\frac{3}{8}$ of an inch in diameter, $1\frac{1}{2}$ inches deep, and 8 or 9 inches apart. Before the copper is placed there should be inserted into these holes cylinders of sheet lead of a length about $\frac{1}{8}$ inch less than the depth of the hole and a diameter the same as that of the hole. The edge of the copper flashing containing a row of holes corresponding to the holes in the Terra Cotta is then turned down over the step at least 1 inch. A No. 12 roundhead brass wood-screw is inserted through the copper and into the lead cylinder. As the screw is driven home it expands the lead cylinder, forcing it against the sides of the hole in the Terra Cotta, forming in effect an expansion bolt, and making a tight and secure fastening. It is generally not necessary to solder over the top of the screw-heads but if much water will come over the edge of the step it is good practice to solder. After being thus secured at the outer edge the copper is laid over the floor of the balcony, using soldered lock seams where necessary, and then turned up against the masonry at least 4 inches where it is lapped by the cap flashing. When the flashing is penetrated by upright posts such as the corner posts of the balcony rail, in this instance, the place where such penetration occurs must be carefully protected by some means such as described in detail in Fig. 66. The regular flashing being first completed, then penetrated as required, and the corner post secured to the masonry, the copper cap is formed around the post or slipped over it

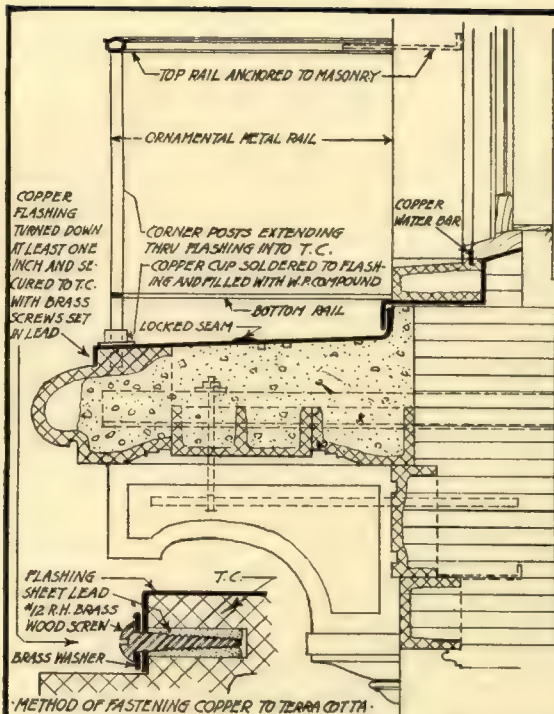
and soldered to the flashing and filled with waterproofing-compound. (See Fig. 66 for a complete description of this method.)

The cap flashing is placed before the Terra Cotta sill, the wood sill, or the balcony-floor flashing are in position. It is made wide enough so that on completion it will lap the floor flashing 4 inches, extend through the wall under the Terra Cotta sill, and up and under the wood sill. After the cap flashing is in place the Terra Cotta sill is placed; then the wood sill. Some prefer to make the flashing wide enough so that it will even extend up in back of the wood sill, but if a water-bar is used this is not necessary. The use of a copper water-bar at the joint between the wood and Terra Cotta sills is recommended.

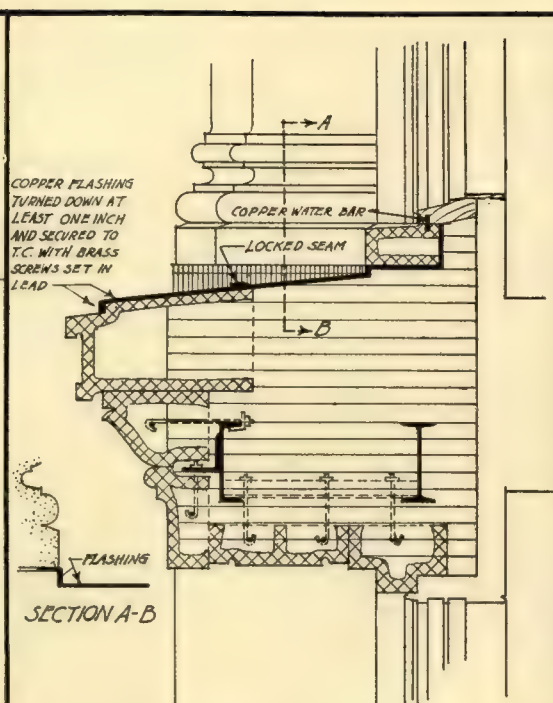
Fig. 64. When a Terra Cotta balcony or similar projecting feature serves as the base for columns, pilasters, or other projections above the floor of the balcony, the flashing is applied as shown in Fig. 64. It is placed in a similar manner to that described for Fig. 63 except that the cap flashing placed under the Terra Cotta window sill is also carried around under the column bases, into the joints of which it is set (as shown by the section in the lower left-hand corner), and built in as the masonry progresses, and before the base flashing and that of the balcony floor is in position. Afterwards the cap flashing is turned down over the base flashing at least 1 inch and the seam soldered.

Fig. 65. A projecting window-cap or cornice of Terra Cotta surmounted by a Terra Cotta balustrade is flashed and the rail steadied and secured to the roof as shown in Fig. 65. Attention is called to the method of avoiding movement of the rail by bracing it from the roof with bronze rods. For this purpose a $\frac{3}{8}$ -inch bronze bar extending the length of the rail is placed on top of the balusters and connected by vertical rods to the steel framing below and also to a stay rod from the main roof. It is important that the points where the ends of these rods are fastened to the main roof be well-flashed.

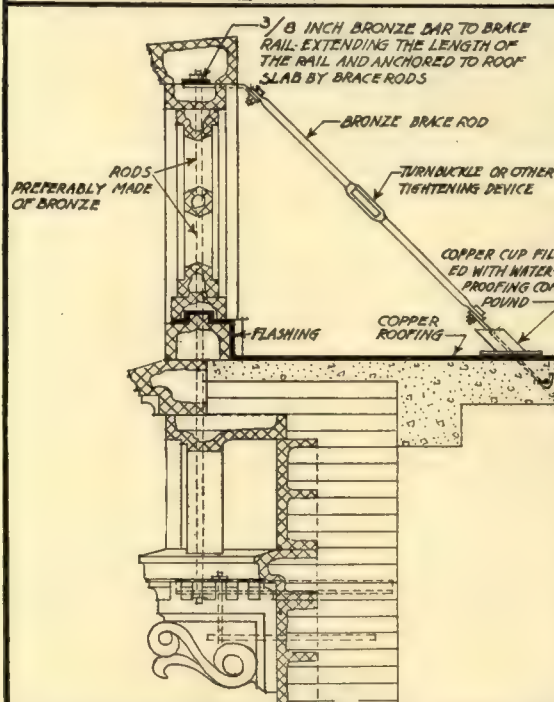
Fig. 66. The left-hand side of the lower part of Fig. 66 shows a half-section and the right-hand side shows a half-elevation of a method of forming a flashing cap of copper and securing it to the regular roof flashing at such places as it may be necessary to penetrate the roof flashing to permit the passage of rods, dowels, anchors or similar metal shapes. In the illustration the cap is shown round but it may be made of any shape, and it should conform roughly to the contour of the penetrating member. The regular flashing sheet is cut at the points of penetration and the surplus metal turned up against the rod. After the regular flashing is completed the cap is placed in position. The cap is made out of a flat piece of copper with a lower edge turned out.



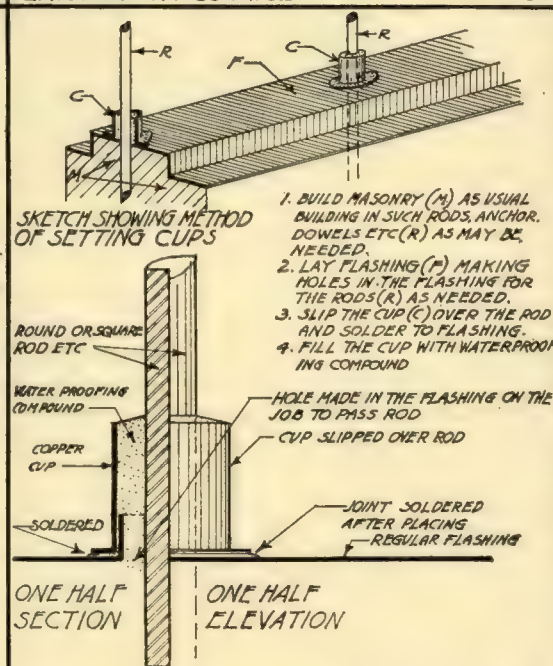
FLASHING FOR A METAL RAILING OVER A TERRA COTTA BALCONY (63)



FLASHING FOR COLUMN BASE OVER A TERRA COTTA CORNICE (64)



FLASHING AND BRACING OF TERRA COTTA BALUSTRADE ABOVE CORNICE (65)



COPPER CUP TO BE USED WHEN FLASHING OR ROOFING IS PIERCED BY RODS ETC. (66)

This piece is either bent around the rod and the ends lapped and soldered or the ends soldered first and slipped over the top of the rod. The lower edge (previously turned out) is then soldered to the flashing. Upon com-

pletion the cap is filled with a waterproofing compound. The cap must be made large enough so the sides will clear the rods, etc., at least 1 inch. The examples of the use of this cap are shown in Figs. 63 and 65.



Old and New Atlantic Terra Cotta



The problem of an addition is simplified when Atlantic Terra Cotta was used in the original building, because the old and new Terra Cotta can be made to match in take up, texture and color.

The three double bays at the right, show the original Atlantic Terra Cotta and brick of the

old building.

The cornice was removed, the main building doubled in size, a thirteenth story and cornice added, and a ten story superstructure.

The Service Department of the Atlantic Company washed the old Terra Cotta and sandblasted the brick. The whole building looks like new.

*Addition to Johns-Manville Building,
New York. Ludlow & Peabody, Archi-
tects; Wm. Crawford, Builder.*

Atlantic Terra Cotta Company

350 Madison Avenue, New York

Southern Factory:

Atlanta Terra Cotta Company

Atlanta, Georgia

Every piece is stamped



*and backed by our
reputation.*

Our Department of Standards will be glad to answer questions from Architects relating to Terra Cotta construction. The best time to ask questions is while the Architects' drawings are in course of preparation. Use of the Standard Specification for Terra Cotta, prepared by the National Terra Cotta Society, is assurance that all bids are based upon doing *at least as much* as the specification requires. Copy on request.

Largest Manufacturers of Terra Cotta in the World

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350 Madison Avenue, New York

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President

Franks G. Evatt
Vice-President

Geo. P. Putnam
Treasurer

Southern Branch

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Southwestern Office

District Manager, A. P. Clark, Praetorian Building, Dallas, Texas

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Atlantic Factories

Plant 1—Tottenville, Staten Island, N. Y.

Plant 2—Perth Amboy, N. J.

Plant 3—Rocky Hill, N. J.

Atlanta Factory

East Point, Georgia (8 miles from Atlanta)





ATLANTIC TERRA COTTA

The della Robbia School
of Today

VOLUME • VII • • MCMXXIV • NUMBER • 2 •

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Standard Specification
for the
Manufacture, Furnishing and Setting
of
Terra Cotta

We recommend the Standard Specification in your preparation of the specification for Terra Cotta.

By its use you make sure that *all* bids are based upon doing *at least as much* as the Standard Specification requires.

We recommend real inspection at the building to make sure that the Terra Cotta delivered is in accordance with the Standard Specification.

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ATLANTIC TERRA COTTA

PRINTED MONTHLY FOR ARCHITECTS



New York City's Terra Cotta Line



Atlantic Terra Cotta Company

350 Madison Avenue, New York

Atlanta Terra Cotta Company

Atlanta, Georgia

Largest Manufacturers of Terra Cotta in the World.

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Plate IV—Atlantic Terra Cotta

Childs Restaurant, Coney Island, New York

Childs Restaurant, Coney Island, New York
Dennison & Hiron, Architects

Color studies by Duncan Smith; modeling by Maxfield H. Keck; Polychrome Terra
Cotta by Atlantic Terra Cotta Company; Hegeman Harris Company, Inc., Builders.

ATLANTIC TERRA COTTA

VOL. VII

SEPTEMBER, 1924

No. 2

The della Robbia School of Today

Childs Restaurant, Coney Island, New York
Dennison & Hiron, Architects

*Color studies by Duncan Smith; modeling by Maxfield H. Keck;
Polychrome Terra Cotta by Atlantic Terra Cotta Company,
Hegeman Harris Company, Inc., Builders.*

CONSISTENT in line and proportion with Italian Renaissance, the new building for the Childs Company is definitely original in detail.

The brilliant polychrome Terra Cotta, instead of following the conventional flower and fruit motive of the della Robbia school, is marine to the last degree—and even submarine in part.

The carnival spirit of Coney Island demands color; it permits almost anything. Childs Restaurant strikes a new note of beauty in surroundings that are naturally festive.

It is not a soft, quiet beauty, but the beauty of color and modeled detail carefully studied, carefully placed in concentrated areas against a background of soft gray stucco.

Every care was taken. The Architects made rough color sketches of detail. The artist developed them in full size, following Atlantic faience colors with a practically unlimited range. Over one hundred Atlantic colors were available for selection. When the modeler finished the plaster models, they were colored and the colors numbered. When the Terra Cotta was glazed and burned, except for a greater depth of tone in the Terra Cotta colors, it was practically impossible to tell which was the colored model and which the finished work.

A bare list of colors gives but little idea for the effect is largely the result of the application, and it requires a sure touch to follow the merging shades of water color in Terra Cotta glazes. A chemist produces Atlantic colors, but an artist applies them.

The basic color is a light conglomerate gray, soft to the eye but exceedingly rough in texture. The stucco follows in tone and texture. Through the whole color scheme the green and blue of sea and sky are dominant; the marine life is executed, as far as the scheme permits, in natural colors.

The arcade and side windows are slightly stronger than pastel colors; the flower boxes, windows, capitals and urns of the upper story are somewhat brighter. The roundels are the brightest of all and stand out like multicolored jewels. Green and blue still dominate but there are touches of scarlet, gold, orange and colors that never were on land or sea.

The building is typically a Terra Cotta design. Even if the colors did not demand Terra Cotta the character of the modeling would be sufficient to make Terra Cotta necessary. The details of flowing water, dripping seaweed, the curved bodies of leaping fishes, require the fluent lines of a plastic material. In Atlantic Terra Cotta the modeling could be executed with the right feeling.

The Childs Building shows that beauty and permanence have a place in Coney Island, where gaudy makeshifts have been the rule. It proves, if proof is necessary, that the colors that American architecture calls for more and more every year are at the Architect's hand; colors that cannot fade and will endure for generations to come, as the 15th and 16th century Terra Cotta of the Italian Renaissance has endured in the past and still endures.





Plate V—Atlantic Terra Cotta

Childs Restaurant, Coney Island, New York

**First Story Arcade, Childs Restaurant
Dennison & Hiron, Architects**

Showing Atlantic polychrome Terra Cotta column capitals, arches, roundels and flower boxes. Modeled detail in various forms of marine life.

Basic color of the Terra Cotta is gray with a rough texture. The green and blue of the sea and sky are the dominant colors, but many other colors are introduced, particularly in the roundels and the modeled detail of the upper stories.





Plate VI—Atlantic Terra Cotta Childs Restaurant, Coney Island, New York

Detail, First Story Arcade
Dennison & Hirons, Architects

Showing the detail of the brilliantly colored Atlantic Terra Cotta of roundels and flower boxes. Roundel on the left is an Elizabethan ship with the sun flashing on the gold work of the raised after deck. Pennant in bright scarlet; emblem on the sail in orange. The right hand roundel shows a Venetian galleon particularly brilliant in color.





Plate VII—Atlantic Terra Cotta

Childs Restaurant, Coney Island, New York

**First Story Side Window
Dennison & Hiron, Architects**

The colors are slightly stronger than pastel colors in the lower story work. Notice how closely the detail follows in form the conventional flower motive of the della Robbia school. As a matter of fact, every detail shows a form of marine life. The only flowers in the entire design are in the form of seaweed.





Plate VIII—Atlantic Terra Cotta

Childs Restaurant, Coney Island, New York

Ship Roundel
Dennison & Hiron, Architects

This roundel is one of the most brilliant pieces of color in the entire building. It shows particularly bright scarlet, orange, white, brown, yellow, blue, green and various other colors, well set off by the background of soft gray.

The flower box brackets in the shape of snails are exceptionally ingenious.





Plate IX—Atlantic Terra Cotta

Childs Restaurant, Coney Island, New York

Upper Story Window
Dennison & Hiron, Architects

Exceptionally interesting piece of modeling and colored work. The whole detail has the effect of water and wet seaweed, and the many colors make the effect truly realistic. The Atlantic Terra Cotta urn at the top of the building is a striking bit of color.

The fluent lines of plastic Terra Cotta are essential in detail of this character.

Atlantic Terra Cotta Construction

Construction and Flashing of Gothic Canopy Cornice

Plate 9

The construction detail illustrates approved methods for supporting and flashing a canopy cornice of Gothic design. In work of this kind, the most important principle is to provide substantial support at the *bottom* of the feature and thereby avoid suspending the Terra Cotta. Though suspended Terra Cotta can be made permanently safe by the use of bronze hangers, it is obvious that it is better to use a built-up method of construction whenever possible.

The pendants that the canopy arches spring from should always be made in the form of brackets, with a bond running into the wall. Pendant features with a bracketed bond on them have a better appearance than suspended pendants and are a great deal safer. In the top bed of pendant shaped brackets we can easily provide for an outlooker composed of two L-irons separated. From this outlooker a bronze bolt goes down through the center of the pendant. The bronze bolt head and washer at the bottom of the boss is hidden by the ornament and is never unsightly. By this method of construction the canopy starts off firm and rigid. There are two safe-guards; one being the bond in the wall and the other the bronze bolt which supports the outer end of the bracket. The outlooker above the pendant takes care of the thrust of the canopy arch as well as serving as a support for the pendant.

The next point is the way the canopy arches themselves are bonded into the wall and have T-iron outlookers in the joints so that each piece is supported almost independently. Usually, 18" or 20" is ample projection for a canopy cornice. Sometimes they are designed with too much projection. If the projection is greater than 20", it often becomes necessary to detach the soffit of the canopy from the canopy arch and then, of course, the construction is not as good as when the soffit and arch are in one piece, and that one piece runs into the wall. Some designers make the mistake of making the ceiling or soffit of the canopy too high. This prevents attaching the ceiling to the arch and also makes it impossible to see the soffit.

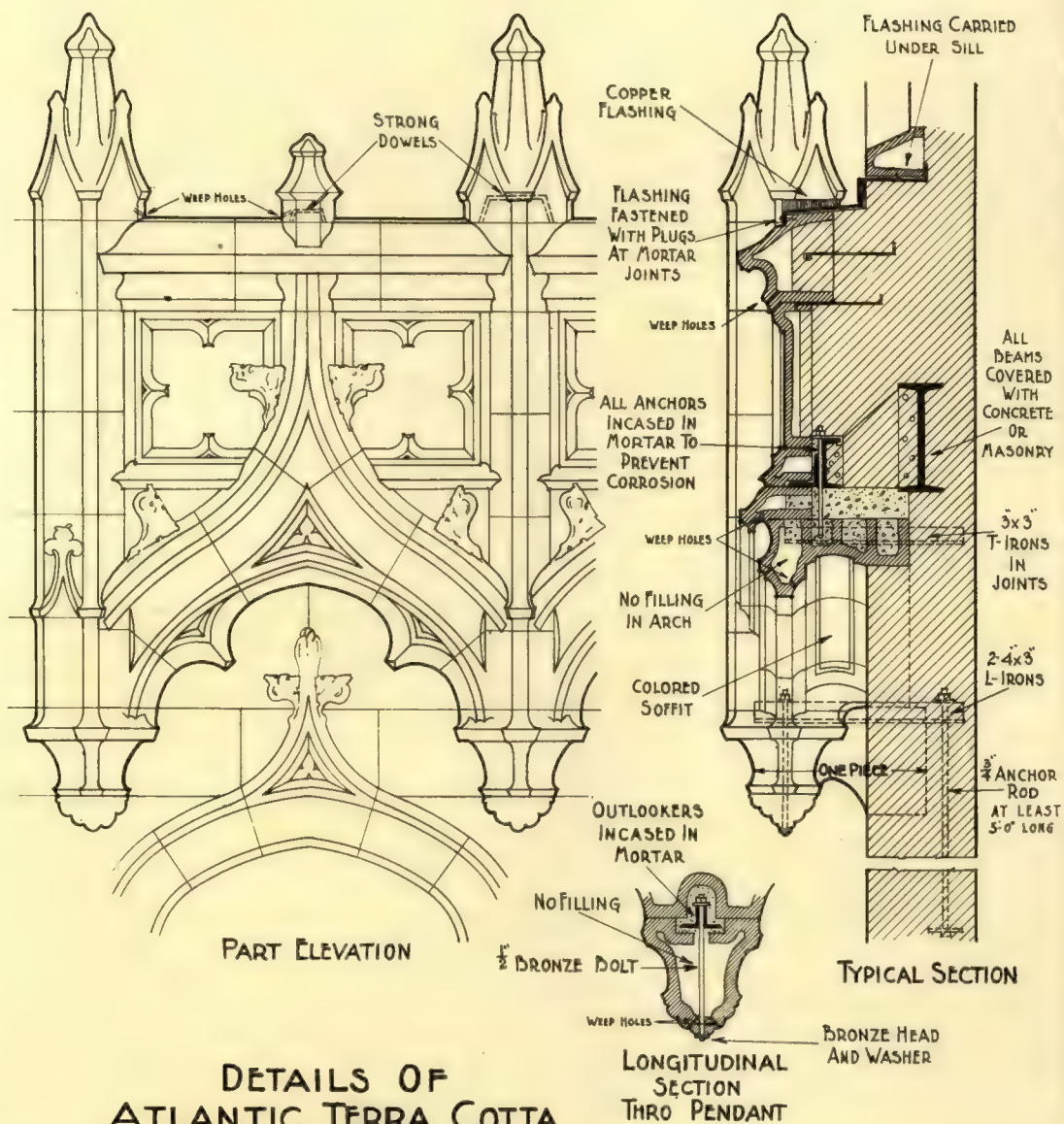
In most cases, the soffit of a canopy looks best in polychrome. When color is used, it is evident that it should not be so deeply in shadow that it cannot be seen.

Another item to be noted is the support of the heavy mass of material above the canopy arch. The best way to take care of this is to provide a continuous steel beam close up behind the bond of the Terra Cotta paneling. This beam may be an I-beam, or composed of a channel and L-iron as shown in our drawing. It is connected to the main wall beam by means of strong steel brackets well riveted to both beams.

The protection of the top of the feature is of great importance. The finials should be made with sockets at the bottom lapping down over strong high dowels on the top course of the canopy. The top course should be covered with copper or lead flashing and another strip of flashing should be built in under the Terra Cotta window sills above this course. It is very advisable to use sheet metal on the top of such features as these because the mortar joints in the washes are almost certain to crack and disintegrate in time and let in moisture if the work is not flashed.

We advise architects not to include too many crockets and small frail ornaments or slender finial tips in their designs. These little ornaments do not count for anything when in place at great height on big buildings and they add greatly to the expense of the work.

A canopy cornice always looks best when enriched with colored decoration. We recommend golden yellow as a safe color to use in the field of Gothic panels. Our color No. 610-D is often used. For parts where an appearance of pierced work is desired, dark blue or gray blue are good colors to use. The actual perforation of tracery is seldom necessary as the most delicate effects can be obtained by the proper use of color. For the soffits of canopies, bright blues are often used for the panel with a border or patterns in bright yellow which looks like gold at a distance. We gladly furnish advice and samples in regard to color scheme on request.



DETAILS OF ATLANTIC TERRA COTTA CONSTRUCTION

CONSTRUCTION AND FLASHING OF GOTHIC CANOPY CORNICE



One of the Roundels

The Venetian galleon with streaming pennants and deck house in bright colors. Quieter green, blue and brown for water, sky and hull.



The brightly colored column capital of the first story arcade.



One of the Roundels

The sun-browned body of Neptune rises from the sea, a gold crown on his head and dripping seaweed festooning arms and trident. Executed in Atlantic Terra Cotta colors.



Spring of arcade arches; typical of the Atlantic Terra Cotta detail.

Childs Restaurant, Coney Island, New York
Dennison & Hiron, Architects

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The Disappearance of
Architectural Landmarks

VOLUME • VII • • MCM XXIV • NUMBER • 3 •

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Plate X—Atlantic Terra Cotta

Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

An early example of the Atlantic Terra Cotta soon to be taken down. The famous tower, a reproduction rather than an adaptation of the Giralda of Seville, topped by the beautiful bronze figure of Diana, has long been one of the notable landmarks in New York

ATLANTIC TERRA COTTA

VOL. VII

OCTOBER, 1924

No. 3

The Disappearance of Architectural Landmarks

Madison Square Garden, New York

McKim, Mead & White, Architects

1889

THE portico of Madison Square Garden is being wrecked with sledge and crowbar to permit the widening of Madison Avenue. This is only the beginning. Next summer the entire building will be razed to make room for a new skyscraper.

There is no trouble with the Garden except that the city has outgrown it. Possibly the interior has been weakened by circuses and prolonged conventions, but the exterior is as sound as ever.

When the Madison Square Presbyterian Church was dismantled and taken down, the Terra Cotta pediment panel was preserved by the Metropolitan Museum of Art, and the main entrance by the Brooklyn Museum of Art and Science. The greater part of the remaining Terra Cotta was used by Mr. Donn Barber in the Hartford Times Building, Hartford, Connecticut.

Little has been done to preserve the Terra Cotta detail of the Madison Square Garden. The column capitals of the portico have been purchased to use again, and the bronze Diana will probably surmount a new apartment building, four hundred feet high, a mile or two north of Madison Square. Perhaps there will be further action of the kind next summer, for many Terra Cotta features could be lifted bodily—or rather piece by piece—and used in new construction. The window detail, Plate XII, if erected in the building that is to take the place of the Garden would be a fitting memorial.

The Madison Square Garden has historical as well as architectural interest. In 1889 J. Pierpont Morgan, Charles Lanier, Darius O. Mills, Charles Parker, and a number of other wealthy

and public spirited citizens formed a syndicate to purchase the site and erect the building. Stanford White, of McKim, Mead & White, was selected as architect.

Another example of the Atlantic Terra Cotta work of McKim, Mead & White is the old Herald Building on Herald Square. The plot is too valuable for a two-story building and before long, no doubt, it will be taken down to make way for a high building that will produce greater revenue.

We quote the following from the August, 1924, issue of *The Architect*:

"When Madison Square Garden is torn down, as we are told it will be in the near future, the country will lose one of the finest architectural monuments that it has yet produced. It might not be impossible to reconstruct the beautiful tower in a new and permanent site. It would be something that the city might well be proud of to think that it had safeguarded and salvaged that much from the demolition, and that Diana might still stand poised on her campanile and bend her bow into the eye of the wind. How many artists and architects, how many thousands of citizens, have caught the message of beauty which the goddess speaks with such silent eloquence. And what a monument it is to Stanford White, that wonderful prototype of the Renaissance.

"There is another Stanford White design which is very characteristic of him, and that is the old New York Herald Building. It will surely pass into the limbo of forgotten things unless some solvent and wise being should have the imagination to use its lovely arcade for some other purpose. The columns and arches, the delicate Terra Cotta work above, the vigorous cornice, all these could easily be reassembled to form a row of the most beautiful shops in the world. They would fit in splendidly in a small community where the land values did not impose a high building."





Plate XI—Atlantic Terra Cotta

Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

Main entrance detail of Atlantic Terra Cotta in perfect condition. If taken down carefully it would be as good as new for future use.





Plate XII—Atlantic Terra Cotta

Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

Second story level; over main entrance, Plate XI. The central feature of this Atlantic Terra Cotta detail would make an interesting entrance for a new building—and at low cost.



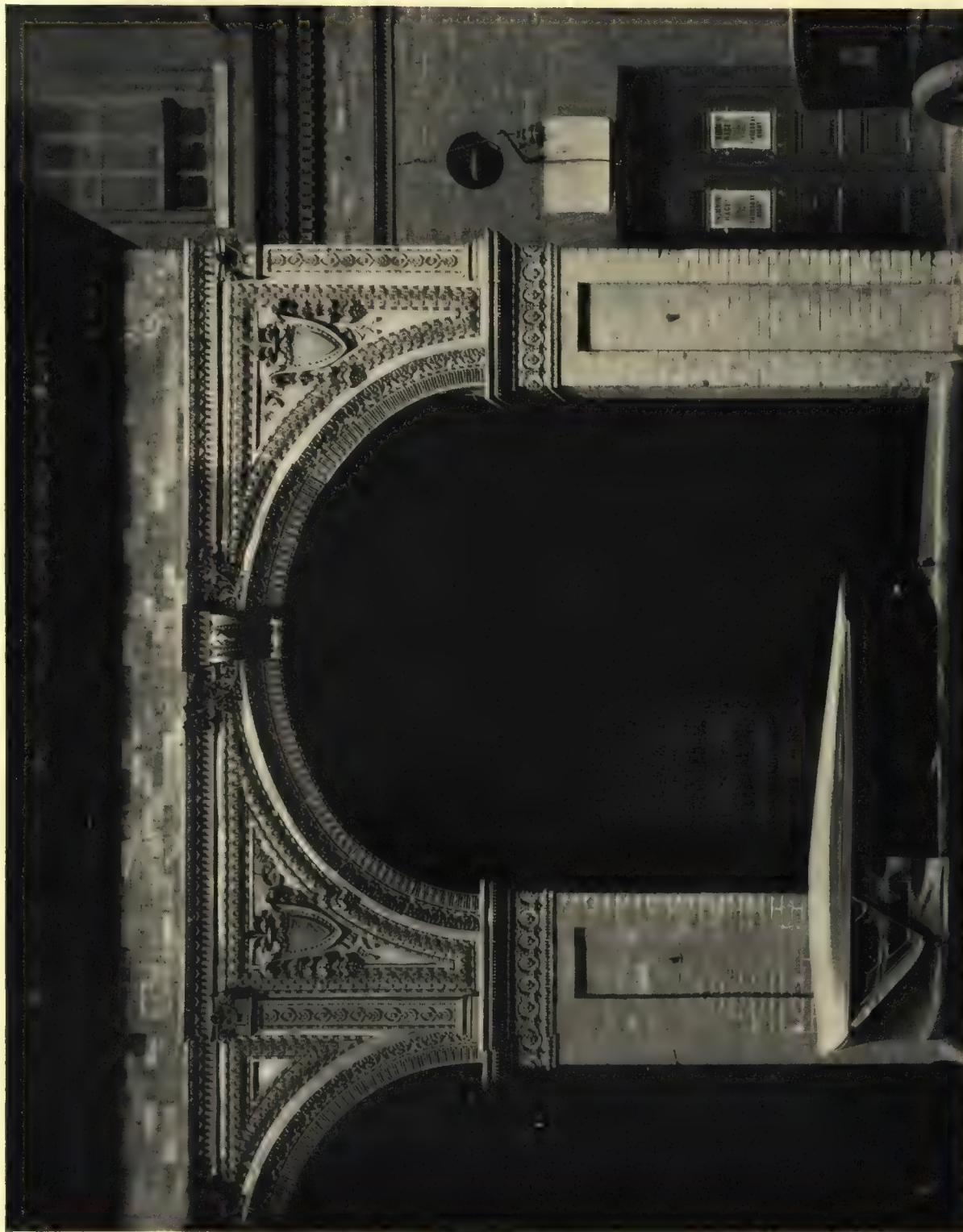


Plate XIII—Atlantic Terra Cotta

Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

Showing that by washing the Atlantic Terra Cotta can be restored to its original cream color after thirty-five years' exposure.





Plate XIV—Atlantic Terra Cotta

Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

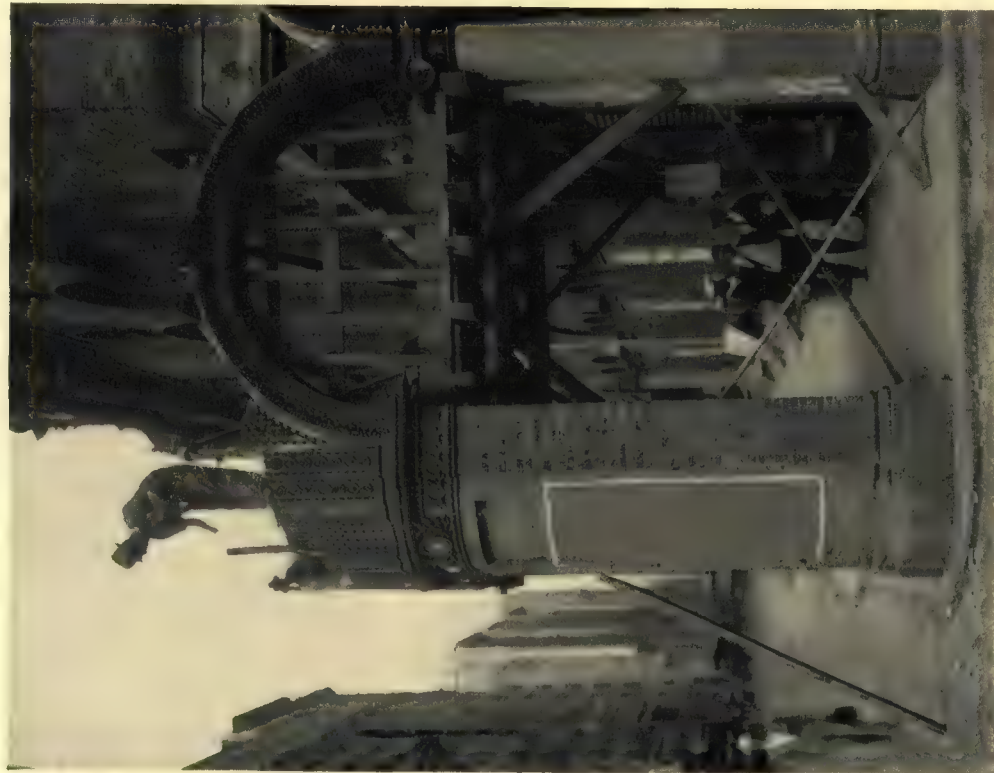
Atlantic Terra Cotta Capital of first story arcade. The capitals have been purchased for use in new construction.





Plate XV—Atlantic Terra Cotta

Strong-arm methods are necessary to break down the Atlantic Terra Cotta and brick masonry of thirty-five years ago. No faults of construction help the wreckers' work. Steel bar and rod wall stiffener, swung out of position at right.



Madison Square Garden, New York City

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

Picking apart corner detail of Atlantic Terra Cotta. Will be broken down with a sledge. Arch to be broken down piece by piece.



Plate XVI—Atlantic Terra Cotta



Fuller Building, New York

Fuller Building, New York

D. H. BURNHAM & Co., ARCHITECTS

1901

The Atlantic Terra Cotta facade of the famous Flatiron is being cleaned by the Atlantic Terra Cotta Company, Service Department.

New Buildings for Old

The Fuller Building, perhaps better known as the Flatiron Building of New York, was erected twenty-three years ago on the busy corner of 23rd Street and Broadway, diagonally opposite Madison Square Garden across Madison Square.

Not as old as the Garden by some years, and erected for an office building, it will be long before the Flatiron outgrows its usefulness. Since the Terra Cotta came from the Atlantic kilns the years have touched it lightly, and, as the illustrations show, the change is not permanent. Washing brings it back to its original striking effectiveness.

The cleaning service of the Atlantic Terra Cotta Company fills a definite need. Familiarity with the product and the best cleaning methods are important factors in successful operation. The usual methods of employing strong acid and sandblast must be avoided. Strong acid does not impair the Terra Cotta structurally but acts on the mortar, frequently dissolving salts that stain the face. Sandblasting removes the glaze, altering the color and leaving a surface that will absorb moisture and dirt. Atlantic Service uses sandblast for stone and unglazed brick—never for Terra Cotta.

Building owners and managers realize the part occasional cleaning plays in maintaining the rental and sale values of an old building. Cleaning pays for itself in either case if done by experienced hands.

An important feature of Atlantic cleaning is that it includes careful inspection, and if pointing of joints or minor repairs are necessary, the work can be done as the cleaning progresses without the expense of separate scaffold equipment on a new contract.

The Madison Square Garden could be cleaned, although the patina of age scarcely affects its beauty. The question is one of outgrown usefulness. In appearance and condition the Madison Square Garden leaves little to be desired.



Madison Square Garden, New York City



Plate XVII—Atlantic Terra Cotta

Madison Square Garden, New York

McKIM, MEAD & WHITE, ARCHITECTS

1889

Preparing to throw cornice piece to platform below, where it will join the other broken Terra Cotta. The voids were filled with masonry to the building line.

Projecting Atlantic Terra Cotta was filled with masonry out to building line. Balustrade hand rail and base completely filled. The mortar of pure lime and clean sand used thirty-five years ago is as hard as rock today. Joints have never needed repointing.

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350 Madison Avenue, New York

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Vice-President

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Treasurer

Southern Branch

Atlanta Terra Cotta Company

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6

ATLANTIC TERRA COTTA

Terra Cotta In Mantua
1444 A. D.

VOLUME • VII • • MCM XXIV •

NUMBER • 4 •

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for the
Manufacture, Furnishing and Setting
of
Terra Cotta

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By its use you make sure that *all* bids are based upon doing *at least as much* as the Standard Specification requires.

We recommend real inspection at the building to make sure that the Terra Cotta delivered is in accordance with the Standard Specification.

The Standard Specification covers the setting of Terra Cotta as well as its manufacture. Make sure that your Builder understands its terms and complies with them in every particular.

The Standard Specification for Terra Cotta was prepared by the National Terra Cotta Society with the cooperation of members of the Architectural Profession and of the National Bureau of Standards.

ATLANTIC TERRA COTTA

PRINTED MONTHLY FOR ARCHITECTS



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Atlantic Terra Cotta Company

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Atlanta Terra Cotta Company

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Largest Manufacturers of Terra Cotta in the World.

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Plate XVIII—Atlantic Terra Cotta

Mantua, 1444

House of Giovanni Boniforti da Concorerri
Mantua, 1444

A Terra Cotta design of unusual interest.

ATLANTIC TERRA COTTA

VOL. VII

NOVEMBER, 1924

No. 4

*Illustrations from photographs collected by
Elisabeth Coit. Measured drawing by Miss Coit.*

Terra Cotta in Mantua 1444 A. D.

THROUGHOUT Italy and particularly in Lombardy, there are hundreds of examples of 15th and 16th century Terra Cotta. The examples are generally churches and cathedrals, famous for architectural beauty, but in out of the way corners and on side streets are many buildings of less importance but equal charm.

The house of Giovanni Boniforti da Concorerro, Mantua, erected in 1444, presents a Terra Cotta window treatment that could be adapted to city residence design today, harmonizing with the facade or in effective contrast.

The idea is not new, but it is a fact sometimes lost to sight that Terra Cotta is the logical material to use for treatment of the kind. A three-story city house in a high class neighborhood would have at least eight windows, and one set of models and moulds would do for the entire number. The window treatment would naturally be reflected in the entrance.

The economy alone would be well worth consideration, but the important point is that in Terra Cotta the desired effect in modeled detail, texture and color could be obtained without difficulty.

The plan is frequently followed in apartment houses of the better type; it is equally appropriate for residence work in city districts in connection with facades of stone, brick or stucco.

The building illustrated follows no accepted

style. The first impression is Gothic but the detail is a combination of Gothic, Romanesque, Renaissance and even Moorish! This description would set the purist's teeth on edge, but on looking at the illustrations one cannot deny the building a considerable element of beauty and interest in even greater degree.

Delicate as the modeling is, the ornament is fresh and crisp. Time has not obliterated the faintest line.

The figure of the angel, Plate XXII, illustrates the feeling the Renaissance craftsmen had for plastic modeling in Terra Cotta. Drapery stirred by a faint breeze, a most difficult subject, is executed with delicacy.

The heavy folds of the gown and cowl on the figure of St. Francis, Plate XXIII, are worthy of Lucca della Robbia. The work is attributed to Lucca, but in Italy there is an inclination to credit the great master with everything in Terra Cotta when the origin cannot be determined.

Take an abrupt jump of five centuries, taking off before Columbus sailed, and turn to the last page. There is a wide gulf between the Santa Maria and the ZR3, but the Atlantic Terra Cotta of the Candler Building is but slightly different from 15th century Terra Cotta. It is made by hand in the same way, and will endure for the same length of time.





Plate XIX—Atlantic Terra Cotta

House of Giovanni Boniforti da Concorerro
Mantua, 1444

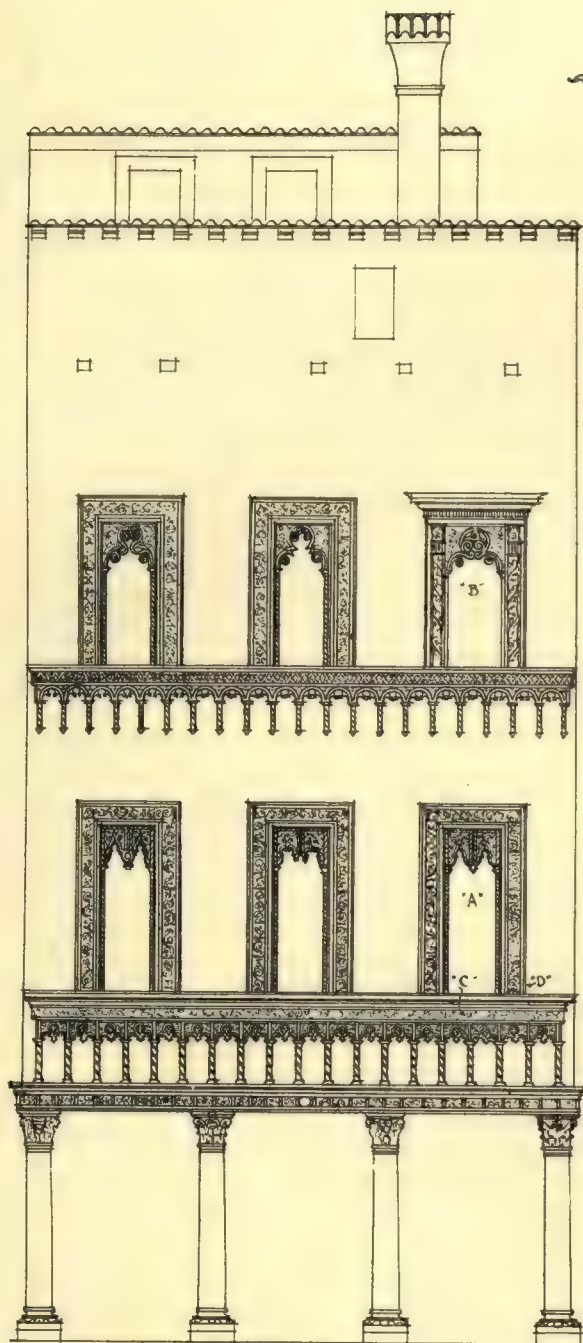
Terra Cotta capitals, cornice and window trim. A Gothic design with unusual variations.

Mantua, 1444

~ HOUSE OF GIOVANNI BONINI ~

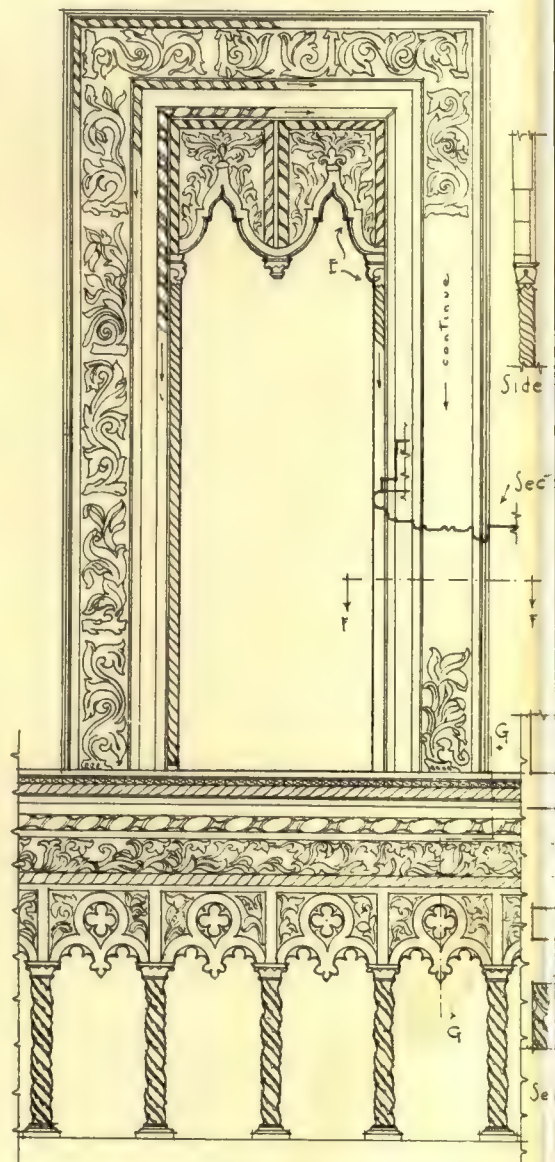
~ A.D. 1400 ~

~ PIAZZA ERBE ~



· FACADE ·

Scale



WINDOW "A"

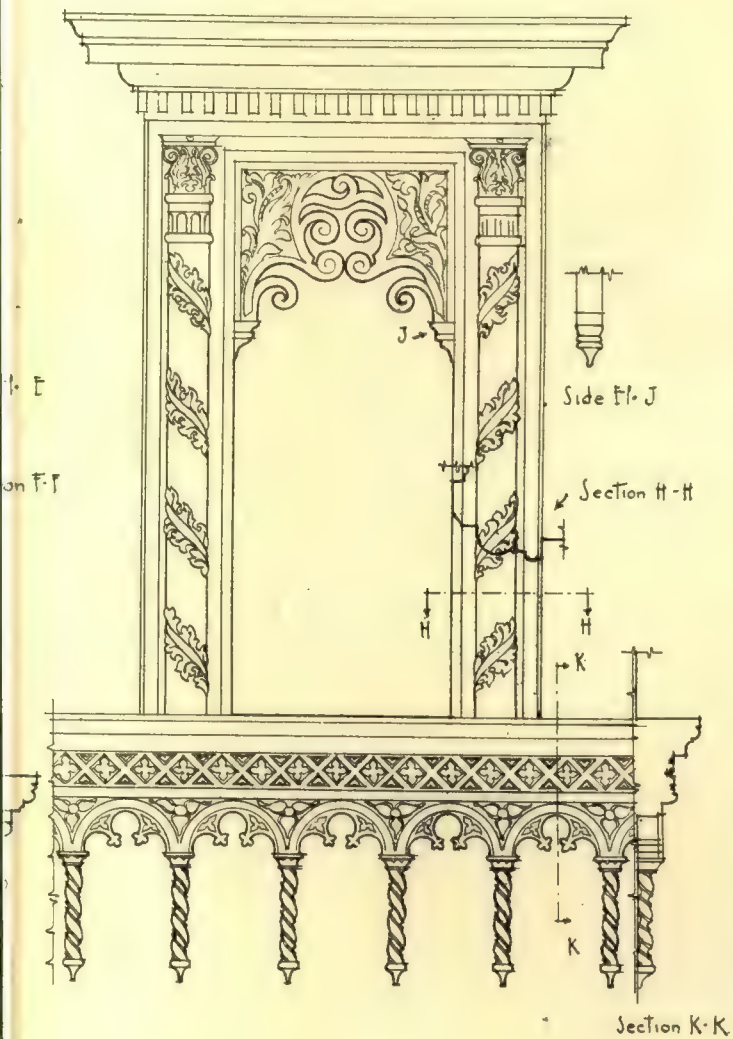
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PORTI · DA · CONCORERRO ·

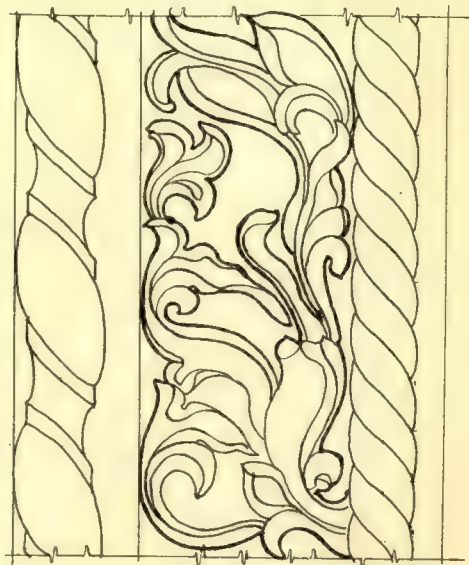
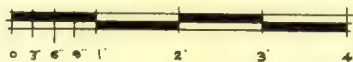
444 ·

· MANTUA · ITALY ·

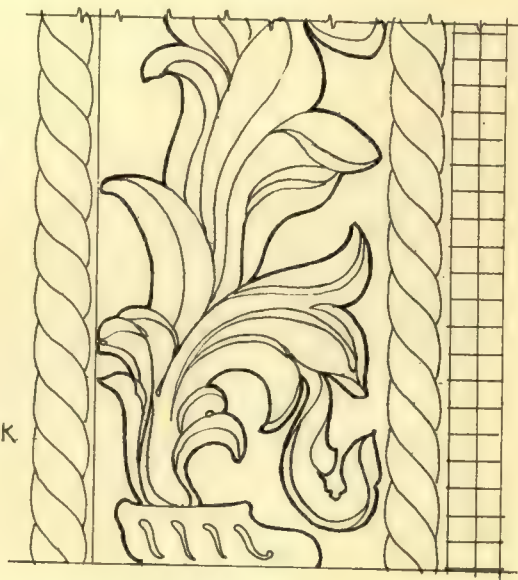


WINDOW "B"

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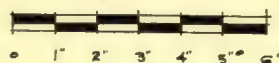


DETAIL AT "C"



DETAIL AT "D"

Scale



· E · COIT ·





Plate XXII—Atlantic Terra Cotta

Mantua, circa 1490

Figure and Engaged Columns of Terra Cotta
Casa C'Arrivabene, Mantua

A beautiful example of drapery modeling. The plasticity of Terra Cotta is clearly shown.





Plate XXIII—Atlantic Terra Cotta

St. Francesco, 15th century, Sienna

St. Francesco, Santa Maria della Osservanza, Sienna
15th Century

The Terra Cotta figure is attributed to Luca della Robbia, and certainly belongs to the della Robbia school. After four hundred years of outdoor exposure it was brought under cover to preserve it—an unnecessary precaution.

Atlantic Terra Cotta Construction

Drips at Nibs Keeping Buildings Clean

Plate 10

In any city it is easy to find a number of buildings that are disfigured by unsightly stains on the face of the belts and cornices. The staining is prevalent on stone buildings and on those faced with Terra Cotta. In most cases the streaks and stains are due to failure to provide drips at the nibs of the projecting courses. Sooty deposits from the atmosphere settle on the washes and when softened by rain run down the face of the mouldings. After a few years the streaks and discolorations become very conspicuous and almost ruin the appearance of the buildings. In smoky cities the streaks are jet black.

Though many architects specify drips and are very particular about having them in certain places, we occasionally have some difficulty in persuading designers to include drips at nibs. Sometimes we are told that a drip at the nib is not architecturally correct. We admit that the introduction of a drip may slightly modify the customary proportions of certain members, but the advantage gained by including the drip greatly outweighs the slight sacrifice in detail. Surely the appearance of the building as a whole is of more importance than a refinement in a single member of the moulding.

As a drip at the nib of a course of Terra Cotta increases the cost of manufacture, some architects wonder why we advocate drips. It is to our interest and also to the interest of the architect who uses our material to have the Terra Cotta looking fresh and clean after long exposure. Attractive buildings are also a credit to the designer. Our effort in the matter of drips is one of the items included in Atlantic Service. It is appreciated by a large majority of the architects who do business with us.

The accompanying plate shows some suggestions for modifications in conventional profiles in order to provide drips at nibs.

Figure 1 shows a conventional cornice profile and Figure 2 shows the slight alteration that produces the drip.

Figures 3 and 4 illustrate how flashed cornices may be detailed so that the edge of the metal forms the drip.

Figure 5 shows another cornice moulding without a drip, and Figures 6 and 7 suggest improvements which provide the desired drip at the nib.

Figure 8 is an example of a badly designed coping, and Figure 9 shows a coping profile properly provided with a drip at each side.

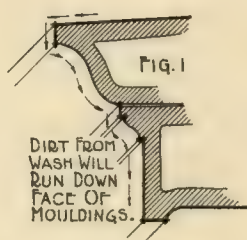
In this connection we draw attention to the fact that a small drip groove is of little value, as the beads of water often bridge it and it does not function properly. A drip groove should be at least $\frac{5}{8}$ " wide and $\frac{3}{8}$ " deep to do its work properly. The projection at the rear of a coping should be about 2" to allow room for an adequate groove and to keep the drip away from the wall.

Figures 10 and 11 show typical profiles of flat belt courses. These are difficult to deal with and about the only modification that we can suggest is illustrated in Figure 12. Though the profile is not ideal we think it is better to use it, especially when the building is in a smoky district.

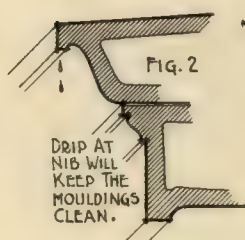
Figures 13 and 14 indicate the wrong and the right way to design a sill.

By providing drips at nibs architects can keep their buildings dry as well as clean. The conditions that produce staining also cause dampness and its attendant evils. In regard to this the U. S. Bureau of Standards, Technologic Paper No. 123 says, with respect to defects in architecture which in winter cause considerable damage to marble:

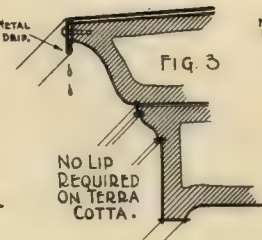
"Where rain falls on the top surface of a projection it runs over the outer edge and following the lower surface reaches the wall, which becomes soaked for some distance below. Also snow which is allowed to remain on these projections finally melts and causes the same difficulty. By the simple method of "throating"—that is, making a groove in the lower surface of projecting members—this difficulty is overcome, as the water when it reaches this groove drops to the ground."



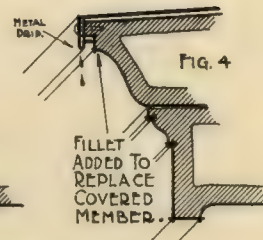
CONVENTIONAL PROFILE.



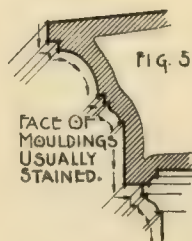
IMPROVED PROFILE.



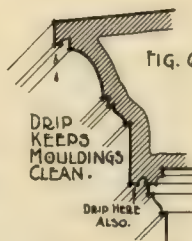
APPROVED DESIGNS WHEN FLASHING IS USED.



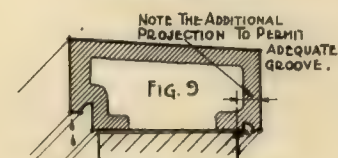
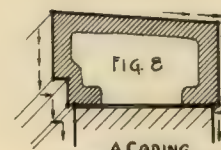
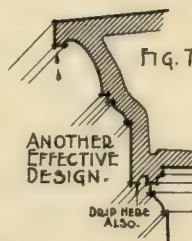
DRIP AT NIB OF CYMA CROWN MOULDING



CONVENTIONAL PROFILE.

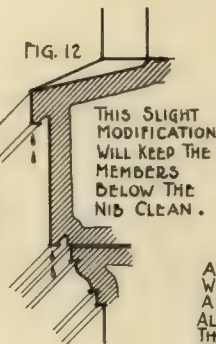
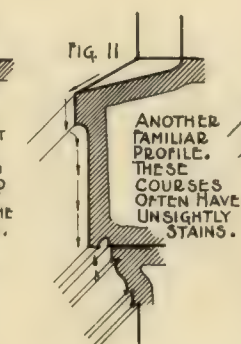


IMPROVED PROFILES.

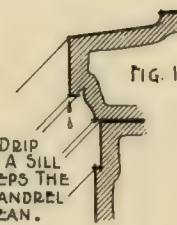
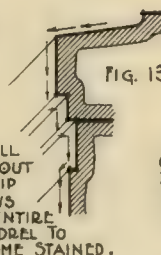


CORRECT DESIGN. THE RAIN FALLS OFF INSTEAD OF RUNNING DOWN AND SOAKING INTO THE PARAPET.

DRIP AT NIB OF CAVETTO MEMBER



DRIPS ON FLAT BELTS



DRIPS ON SILLS

DETAILS OF ATLANTIC TERRA COTTA CONSTRUCTION

SUGGESTIONS FOR MODIFICATIONS IN CONVENTIONAL PROFILES TO PROVIDE DRIPS AT NIBS



(Photograph from Wide World Photos)

ZR-3 Investigates Atlantic Cleaning Operations October 15th, 1924

The twenty-four story Atlantic Terra Cotta shaft of the Candler Building, New York, Shape & Bready, Architects, was erected for Mr. Asa G. Candler, of Atlanta, twelve years ago. It is being cleaned by the Atlantic Service Department. The cream matt glaze comes out as fresh and clean as it was when it came from the Atlantic kilns.

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ATLANTIC TERRA COTTA

English Terra Cotta
1424-1610

VOLUME • VII • • MCMXXIV •

NUMBER • 5 •

FILE NO. 9

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Plate XXIV—Atlantic Terra Cotta.

Gifford's Hall, Nayland, Suffolk.

Giffords' Hall, Suffolk, 1424

Gothic detail in Terra Cotta applied to a Tudor design over entrance, under pinnacle, and around turret tops. A design that could be well adapted for an American school building.

ATLANTIC TERRA COTTA

VOL. VII

DECEMBER, 1924

No. 5

English Terra Cotta

1424-1610

THE Tudor Period in England emerged from the late Perpendicular Period in the fifteenth century and merged with the Elizabethan at the beginning of the seventeenth century. It began with the reign of Henry VII and ended with the reign of Elizabeth in 1603.

While the Tudor Period had certain defined features it was primarily a period of transition. Inigo Jones changed its trend at the end of Queen Elizabeth's reign, and his work was carried on later by Sir Christopher Wren.

It is not likely that the Tudor style will ever die out entirely. It was seldom used ecclesiastically but for country estates and manor houses, and for school and university buildings, a Tudor design is particularly appropriate.

The use of Terra Cotta in the detail was introduced by the Italian architects who were appointed architects to the Crown by Henry VII and Henry VIII, and who had become familiar with the use of Terra Cotta during the late years of the Renaissance in Italy.

Gifford's Hall, 1424, was erected by Philip Marmock in Nayland, Suffolk. The Gothic detail, which shows its close association with the Perpendicular style, is of Terra Cotta. This may be seen over the main entrance, under the central pinnacle, and around the upper part of the turrets. The design could be well adapted for a school building in America; it would be somewhat simpler than the Collegiate Gothic which is so often applied.

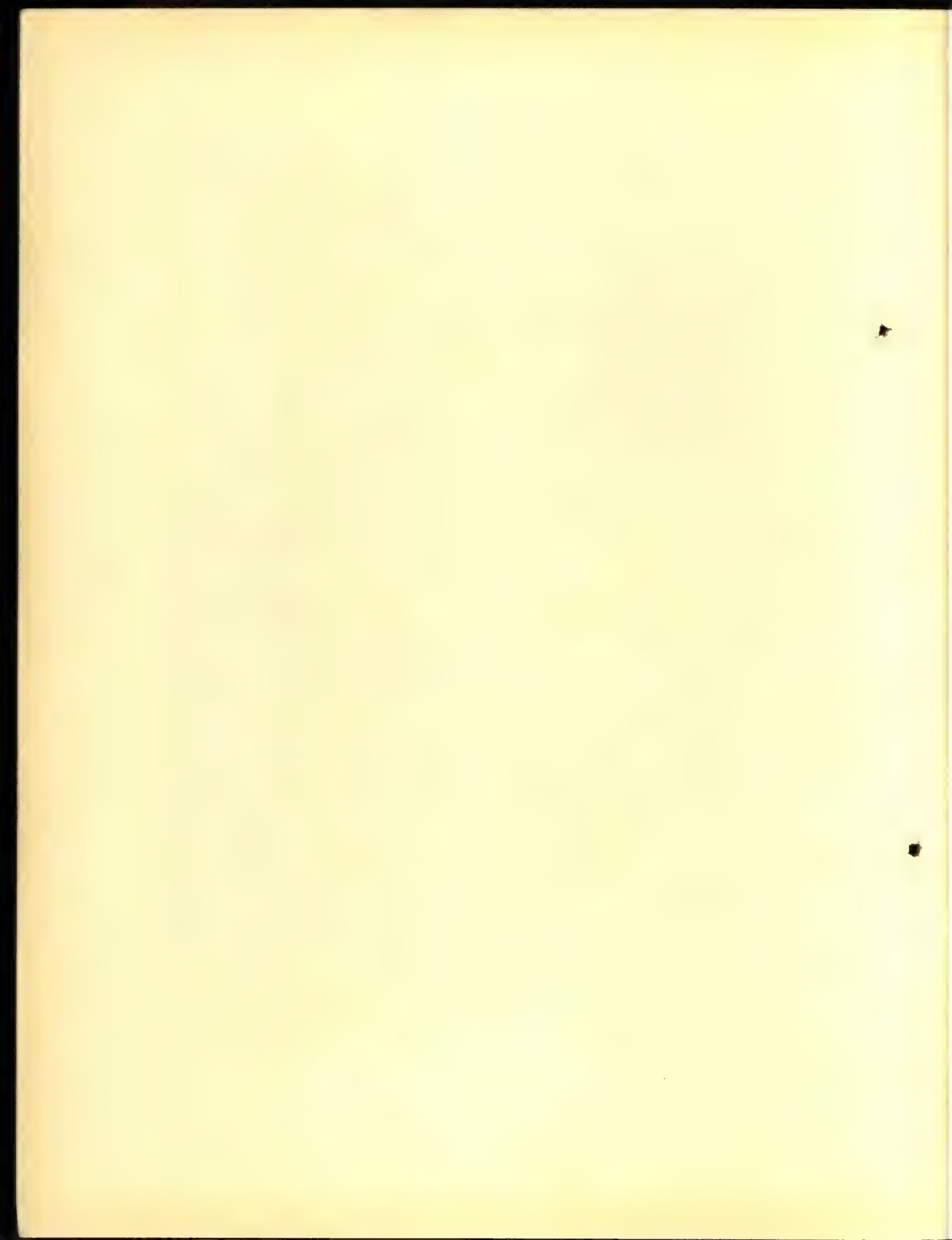
It is easy to imagine the portcullis and drawbridge that protected Gifford's Hall when it was first built, and the defenders behind the battlements.

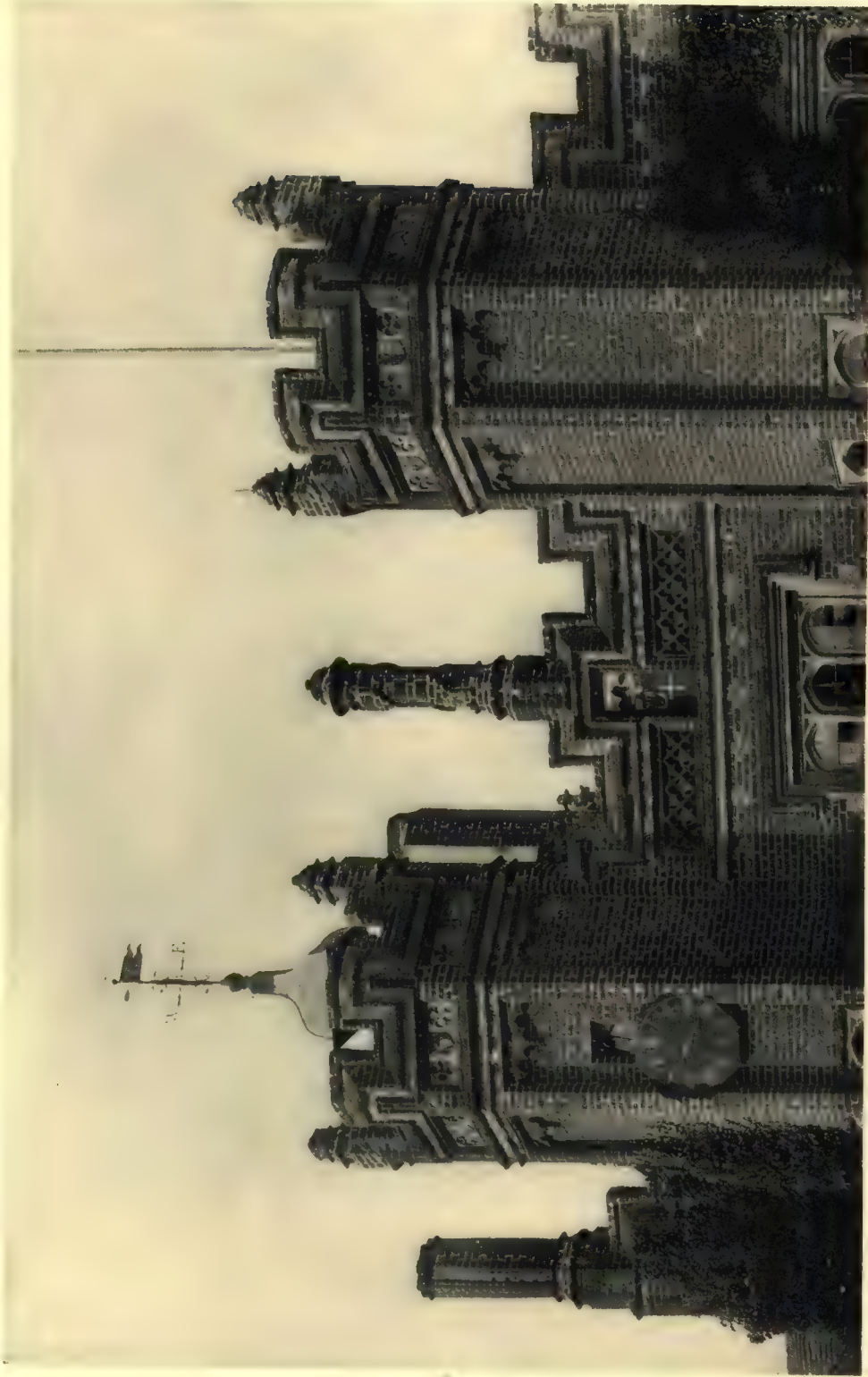
Undoubtedly the gate house of West Stow Hall, Suffolk, was originally protected by a moat. It has undergone several changes. Additions were added in the 16th century and as recently as 1906 the building was restored by William Weir. The Gothic detail and the pinnacle images are Terra Cotta.

Ham House, Surrey, was built by Sir Thomas Vavasor in 1610. The Terra Cotta interest centers in the statue of Father Thames, added in the 18th century. Naturally the statue is not monolithic.* One of the joints can be seen above the left knee. The busts in the recessed ovals are Terra Cotta and probably the chimney caps, but the building itself is brick and stone.

Holland House, erected in London in 1607 by Sir Walter Cope, is a comparatively new building as time is rated in England. The designs of the Architect, John Thorpe, are still preserved in the Soane Museum, Lincoln's Inn Fields—which offers a suggestion to the curators of American museums. The Terra Cotta is confined to the central bay above the second story and to the pinnacles and charmingly haphazard individual and group chimney pots.

**The largest single piece of Terra Cotta is a statue of the Three Graces, modeled by R. Hinton Perry. The figures are eight feet in height, made of Atlantic Terra Cotta.*





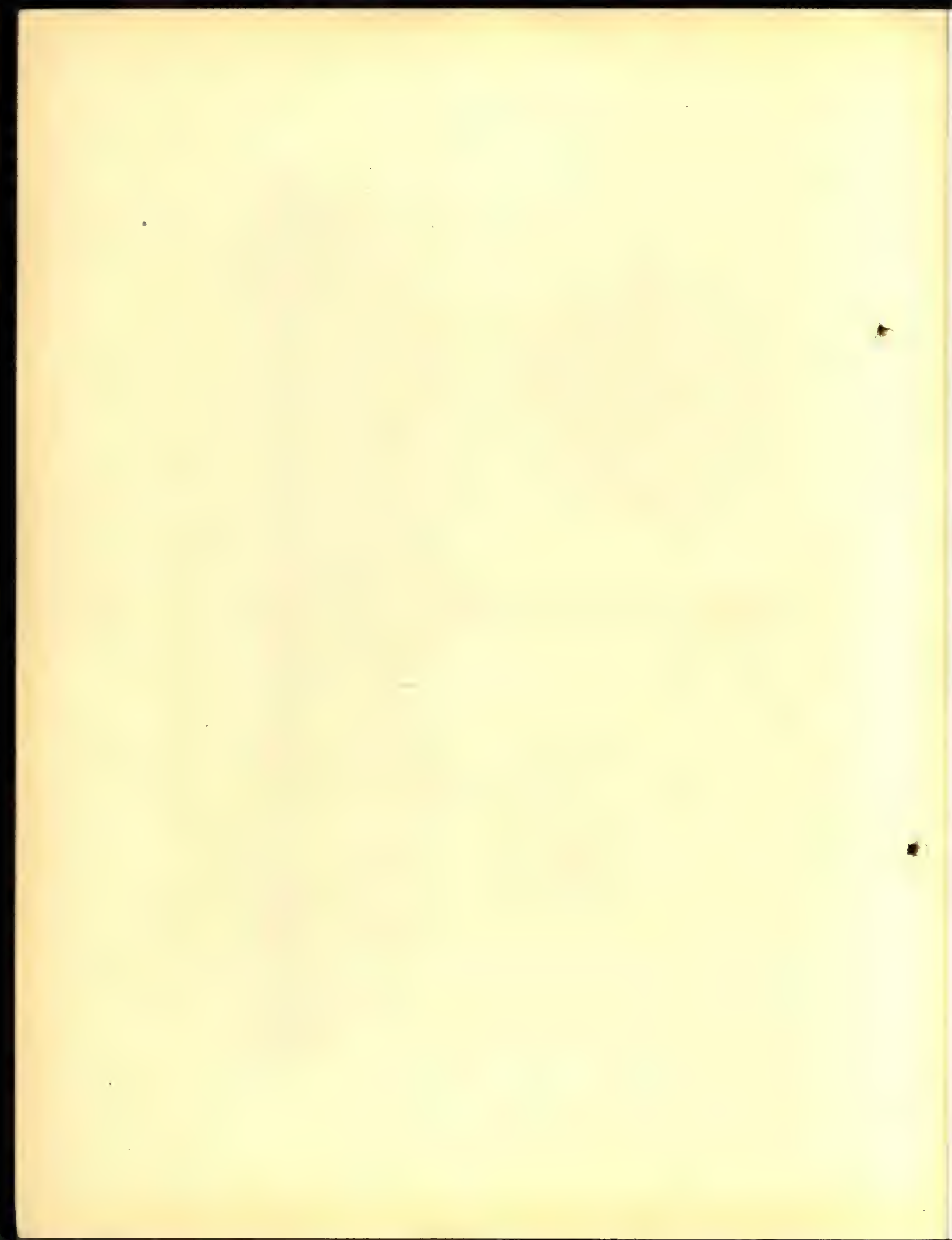
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Plate XXV—Atlantic Terra Cotta.

Gifford's Hall, Suffolk, 1424

Gifford's Hall, Nayland, Suffolk.

Detail of Terra Cotta below pinnacles and around turrets.





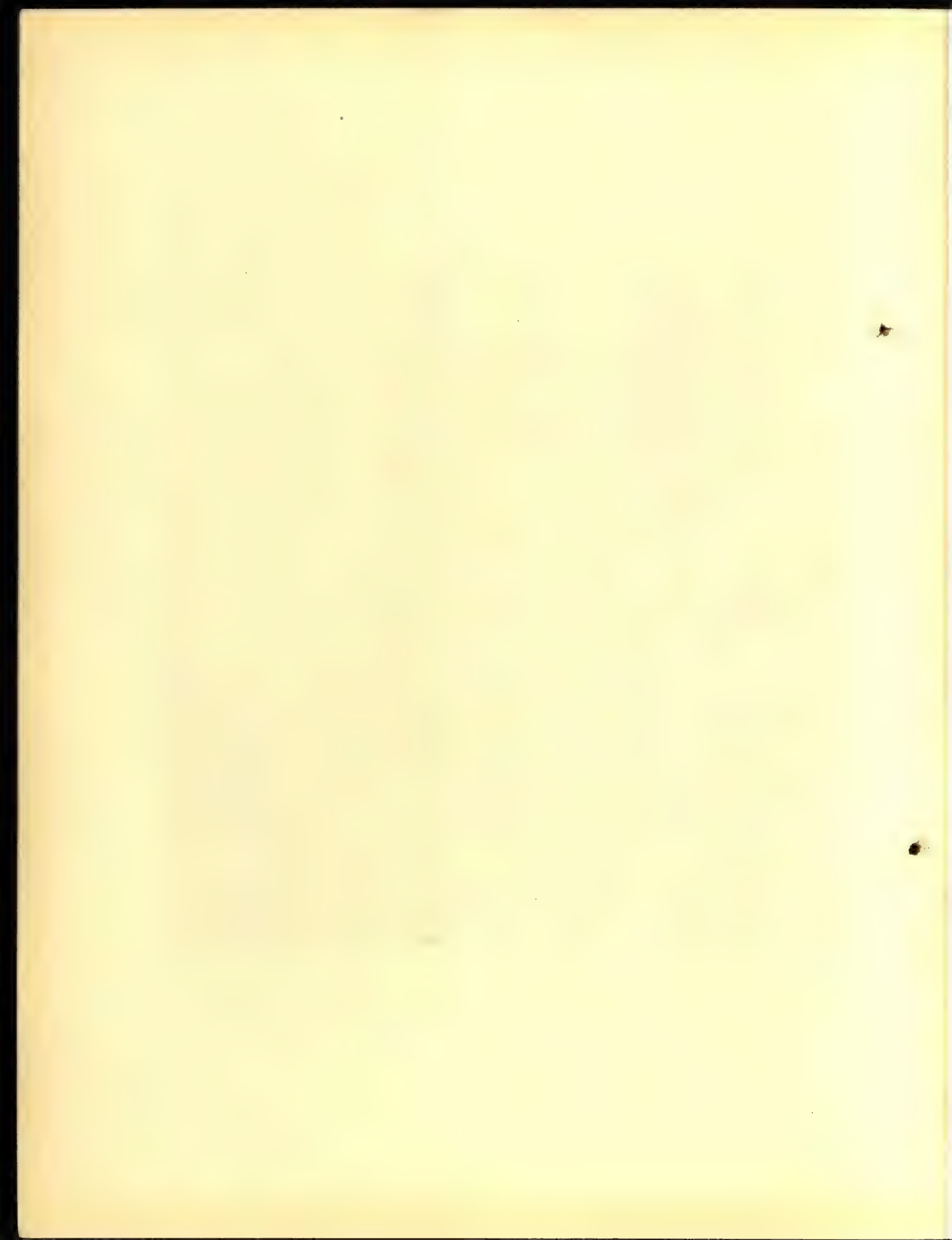
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Plate XXVI—Atlantic Terra Cotta.

West Stow Hall, Suffolk.

West Stow Hall, Suffolk, Fifteenth Century

Gothic detail applied to a Tudor design, foil detail, over entrance, under third story window, and pinnacle figures. A gate house once protected by a moat. A design that could be adapted for ecclesiastical work.





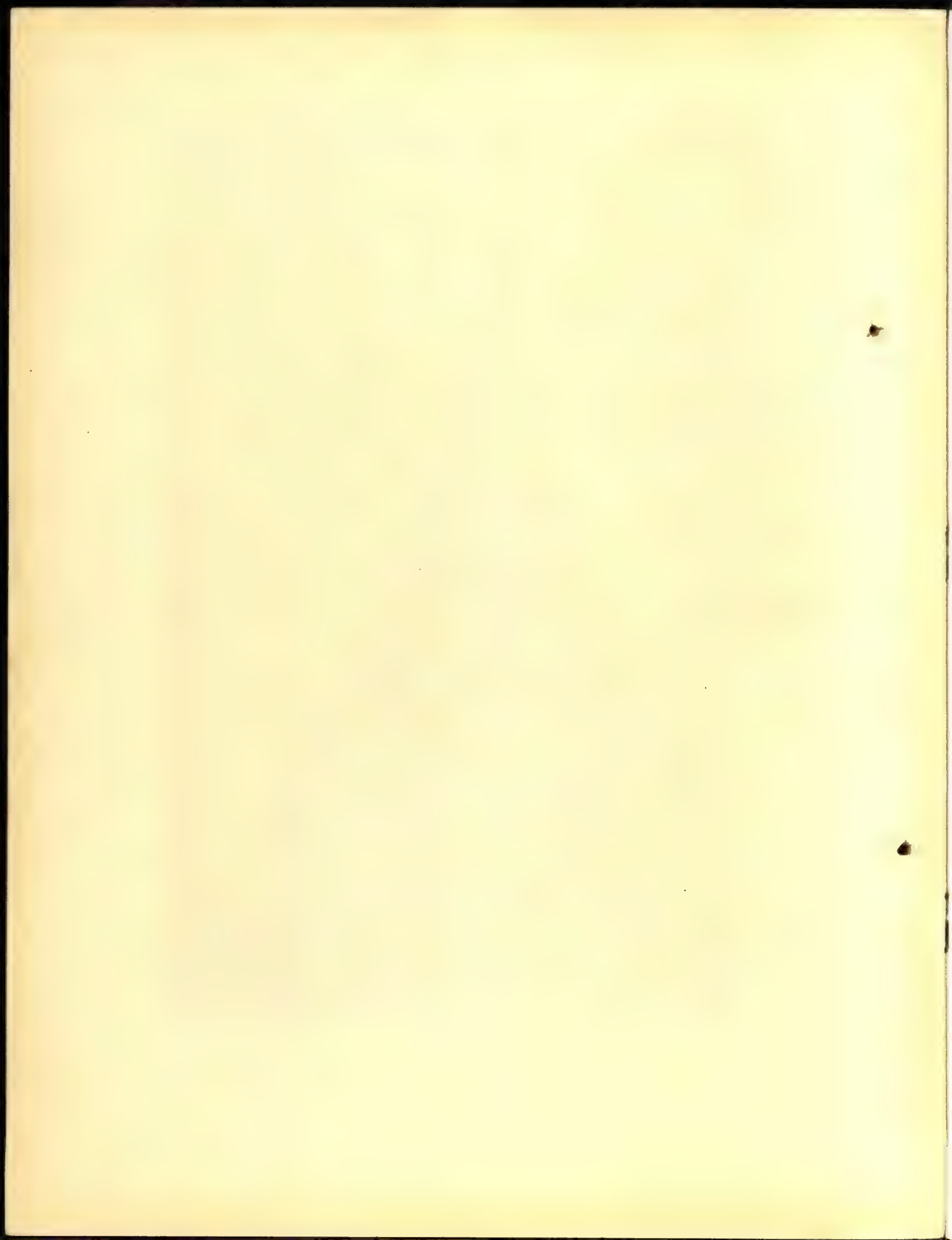
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Plate XXVII—Atlantic Terra Cotta.

West Stow Hall, Suffolk.

West Stow Hall, Suffolk, Fifteenth Century

Pinnacle roofed with crude Terra Cotta blocks and topped with a Terra Cotta figure.





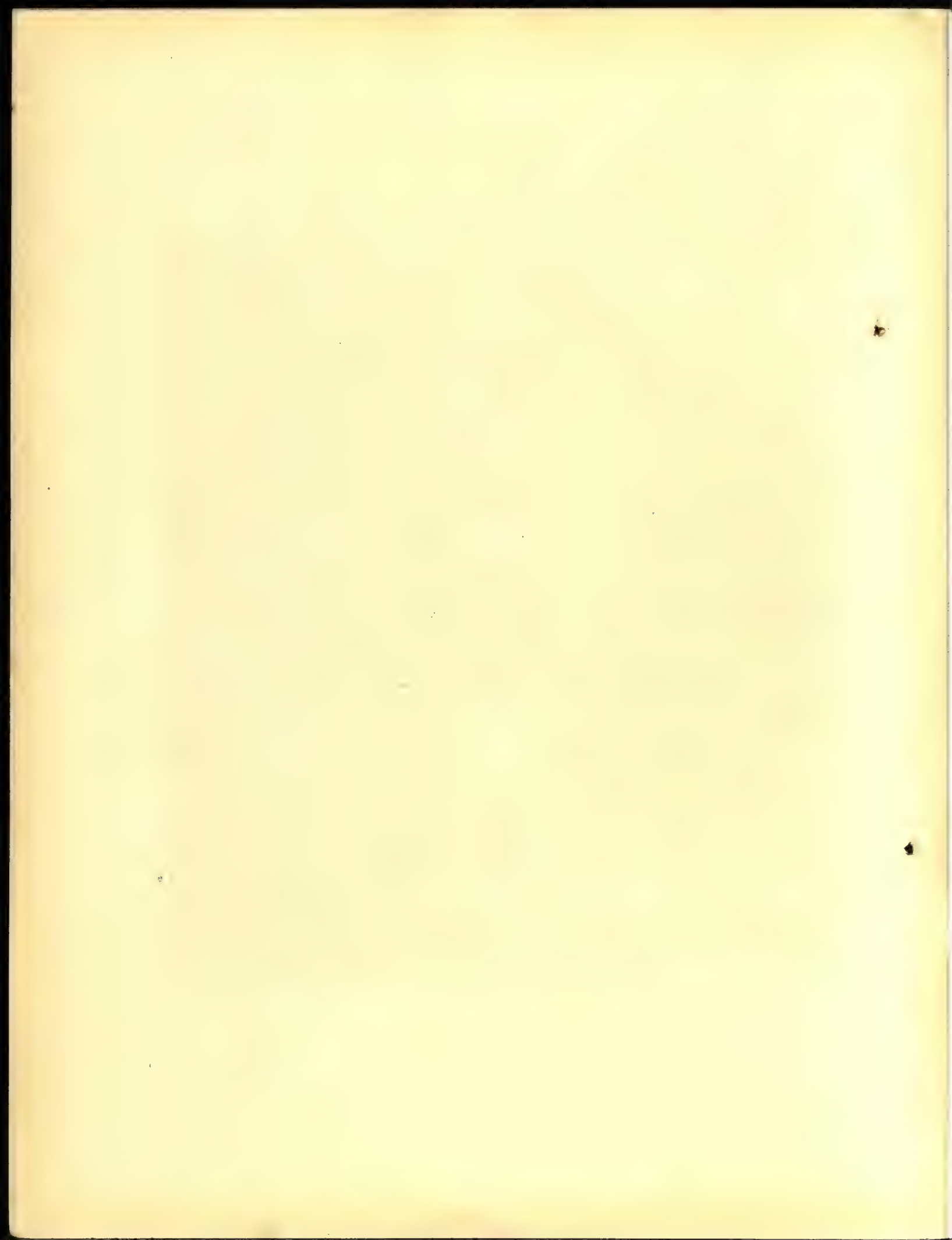
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Plate XXVIII—Atlantic Terra Cotta.

Ham House, Surrey.

Ham House, Surrey, 1610

The Terra Cotta interest centers in the heroic figure of Father Thames and the busts in the oval recesses of the Elizabethan house. Terra Cotta offers an enduring medium for sculptor's work, one that he can model as he models clay, and one in which duplicates can easily be made.





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Plate XXIX—Atlantic Terra Cotta.

Holland House, London.

Holland House, London Circa, 1607

Terra Cotta applied to an English Renaissance design for upper two stories of bow window and chimney pots.

Keeping Buildings Safe

Rust Proof Anchors and Supports

The Udylite Process

The life of the iron supports that are used in the construction of architectural features of stone and Terra Cotta is a matter that demands the earnest consideration of architects in view of the danger resulting from corrosion, in time, of the metal.

There have been cases brought to our attention where serious damage has resulted by reason of neglect properly to protect metal supports from rust. This damage has been attributed to defective Terra Cotta when the truth is that the Terra Cotta was not defective and the damage was clearly due to negligence in using metal supports that were not permanent. It was a combination of a short-lived metal with a material that is practically everlasting. It is time for architects, owners, and building managers who are desirous of building for permanence, to understand this and to provide, at a trifling expense, for protecting valuable materials of construction, thus obviating unnecessary maintenance.

The best modern practice in Terra Cotta construction is to reduce to a minimum the use of metal supports. The leading Terra Cotta manufacturers are using their influence to have projecting features designed with as little metal as possible. The ordinary tie anchors that are sometimes specified for securing ashlar and belt courses to masonry walls are often entirely unnecessary. Whenever Terra Cotta can be properly bonded into the brick backing, metal anchors should be eliminated entirely. On the other hand, when the use of metal supports is unavoidable, they should be of ample strength and should be protected against deterioration in most thorough manner.

In designing and specifying anchors and supports, there are two important points to be considered. First, the initial strength of the metal must be sufficient to insure satisfactory setting. Secondly, the iron must be protected against corrosion so that there will be no risk of failure at some future time. It is obvious that the metal must not only be safe,—it must *stay* safe.

Iron Requires a Rust Proof Skin:

If iron anchors are incased in a rust proof skin, it is impossible for air to get to the iron, and

without air corrosion cannot take place. Moisture alone will not cause rust, but a combination of air and moisture will destroy iron very rapidly. It is hardly possible to keep dampness out of exposed masonry, but air can be kept away from iron anchors by coating them with a permanent skin of rust proof material.

Paint Is Not Permanent:

One of the big mistakes made in the past has been in supposing that a coating or two of asphaltum paint or red lead would preserve anchors against corrosion. Recent investigations indicate that the protection of iron anchors by painting is not to be depended upon. If there is a damp atmosphere within the voids of the masonry, or dampness present in the joints, rust spots form on painted anchors sooner or later. The spots spread and flaking of the paint begins. After that the deterioration of the iron is very rapid. As the iron changes into hydrated ferric oxide, it forms into layers and increases greatly in size. Moisture, freezing between the layers of rust in winter, hastens the destruction of the metal. There have been cases where the expansion of the rust flakes on iron rods and shapes has been powerful enough to crack the material in which the iron was contained.

Cement Mortar Protection:

Cement mortar is an excellent protection for iron anchors, but while the architect may specify that all anchors are to be thoroughly imbedded in mortar, it is not always easy to supervise the work of every mason employed on a job and be sure that every one of the anchors is carefully incased. As any iron anchors that are not completely and tightly surrounded with cement mortar are likely to rust, it is better practice to have the anchors rust proofed before they are used. The expense of rust proofing is only a trifle in comparison with the security that is obtained.

The Udylite Rust Proofing Process

We have investigated the different methods used in protecting iron against corrosion and find that the Udylite Rust Proofing Process is far superior to any other method now in use. Therefore, we strongly recommend it to architects and

suggest that in specifying anchors and loose metal supports a provision be made for rust proofing them by the Udylite process.

The Udylite Process of Rust Proofing consists of electro-plating iron or steel with a thin coating of cadmium about .0004 inches in thickness. The plated metal is then baked for two or three hours at a temperature of from 300 to 400 degrees Fahrenheit. This baking process causes the cadmium to penetrate the iron and form a perfect alloy, which is extremely resistant to atmospheric corrosion. By this method the iron is protected not only by a skin of pure metallic cadmium, but also by an inner layer of cadmium-iron alloy.

The adhesion or bond between cadmium and steel is so strong that it is practically impossible to disrupt the coating by physical abuse. This property is of great value in anchors which may be subject to distortion during adjustment at the building. The cadmium coating is also so ductile that it will peen under a blow instead of cracking, chipping, or flaking as would be the case with a plating of zinc.

The most valuable property, however, of a cadmium coating is extreme resistance to corrosive and saline atmospheres. Standard salt spray tests conducted by the Underwriters Laboratories of Chicago, clearly show that a coating of cadmium .0002 to .0003 inches in thickness will resist corrosion three times as long as a similar coating of hot galvanizing. Samples of Sherardized metal with a zinc coating .0009 inches in thickness—three times the thickness of the cadmium coating—will break down under the same tests in half the time it takes to penetrate cadmium. The extreme difference in rust resistance of cadmium as compared with other metals has caused it to be universally accepted as the best metal for resisting atmospheric corrosion.

Zinc galvanizing and Sherardizing are good enough methods in their field, but they do not provide one-half the security that is obtained by the Udylite process.

No allowance need be made for the plated coating on threads when using the Udylite process. If threaded parts are galvanized or Sherardized and a proper allowance is not made in the threads, re-threading is necessary, and this, of course, destroys the protective coating in the very place where it is most needed. The cadmium

coating does not clog the threads and no re-threading is necessary.

The Udylite Process is now in general use for high grade rust-proofing. It is applied for the protection of exposed fittings used by the large Telephone Companies, etc. The present cost of Udyliting is about 5c per pound of iron or steel treated. It is more expensive than galvanizing or Sherardizing, but it gives much greater protection. It is anticipated that as the use of cadmium increases, the cost of the process will decline somewhat.

Plants are in operation in different parts of the country for applying the Udylite process. Builders can easily arrange to have the anchors and other loose iron sent to the nearest Udyliting Plant for treatment.

As a proof of our deep interest in permanent building construction, we shall be glad to co-operate with architects and builders and assist them in arranging for the rust-proofing of anchors that are to be used with Atlantic Terra Cotta. If desired, we will accept contracts to supply cadmium plated anchors that are required in connection with contracts for Terra Cotta.

We have made arrangements with the Metal Finishing Department of the Pyrene Manufacturing Company, Newark, New Jersey, who are operating a modern plant for Udylite Rust-Proofing, to undertake the plating of iron anchors in any quantity. Mr. Luis E. Eckelmann, the Manager of this Department, will be pleased to co-operate with architects who wish to use Udylited anchors and will be happy to furnish further information and data on comparative tests whenever required.

We have inspected the plant of the Pyrene Manufacturing Company and are satisfied that all the work they undertake will be done under scientific control and under general conditions that insure the maximum protection that can be obtained by this process.

A short specification to cover the Udyliting of anchors may read as follows:

"All anchors and loose iron work used in connection with the Terra Cotta shall be thoroughly cleaned by sandblasting and shall then be rust-proofed by the Udylite Cadmium Plating and Alloying Process. The thickness of the cadmium coating shall not be less than .0004 inches."



(In Process of Cleaning)

Union Central Life Insurance Co. Building, Cincinnati, Ohio, Cass Gilbert, Architect; Garber & Woodward, Associated. Entirely of white matt glazed Atlantic Terra Cotta from third story to cupola roof.



Glazed Atlantic Terra Cotta can be cleaned as a glass window is cleaned, with soap and water.

In the instance illustrated the cleaning was done by the Atlantic Terra Cotta Company, Service Department.

Atlantic Terra Cotta Company
350 Madison Avenue, New York

Atlantic Terra Cotta Company
Atlanta, Georgia

Our Department of Standards will be glad to answer questions from Architects relating to Terra Cotta construction. The best time to ask questions is while the Architects drawings are in course of preparation.

Every piece is stamped



*and backed by our
reputation.*

Use of the Standard Specifications for Terra Cotta, prepared by the National Terra Cotta Society, is assurance that all bids are based upon doing at least as much as the specification requires.

Copy on request.

Largest Manufacturers of Terra Cotta in the World

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350 Madison Avenue, New York

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Franks G. Evatt

Vice-President

Geo. P. Putnam

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Atlanta Factory

East Point, Georgia (8 miles from Atlanta)



ATLANTIC TERRA COTTA

Polychrome Terra Cotta

VOLUME • VII • • MCMXXV • NUMBER • 6 •

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An exceptional grade from antique Grecian and Florentine design.

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Atlanta, Georgia

Largest Manufacturers of Terra Cotta in the World.

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Plate XXX—Atlantic Terra Cotta

Archaic Grecian Terra Cotta

Terra Cotta, VI or V Century, B. C., Greece

Excavated fragments of Grecian Temples protected from the light for many centuries, show faint traces of the brilliant colors that once decorated all Grecian Temples.

ATLANTIC TERRA COTTA

VOL. VII

JANUARY, 1925

No. 6

Illustrated from photographs collected by Frederic C. Hiron, of Dennison & Hiron, Architects; Elisabeth Coit, Architect; and H. V. K. Henderson, Office of Raymond M. Hood, Architect.

Polychrome Terra Cotta

GRECIAN Temples stood for centuries for everything that was chaste in color. The realization that practically every temple was originally a brilliant example of polychrome dates from comparatively recent years.

The early Greeks had no knowledge of fired glazes, the only permanent colors, and rain and sun have obliterated the colors on the buildings above ground. Only faint traces remain on the Terra Cotta and stone brought to light by excavation, but from these traces it is possible to reconstruct the colors as they originally were.

Classic designs have been adapted again and again for modern architecture, but almost always in monochrome white or gray. The late Stanford White was the first to develop the temple type in colors, but without attempting to adapt the Greek style. Strangely enough this first adaptation of a temple erected to a mythological divinity was built for a Christian church, Dr. Parkhurst's Madison Square Presbyterian Church, in New York. Unfortunately this building has been taken

down, but parts of the beautiful polychrome Terra Cotta have been preserved by the Metropolitan Museum of Art, New York, and the Brooklyn Museum of Art and Science. Certain sections were used in the erection of the Hartford Times Building.

In the Italian Renaissance period the della Robbias developed Terra Cotta glazes so that the Italian polychrome architecture of the fifteenth and sixteenth centuries has come down to the present day without the slightest change.

Fired Terra Cotta glazes are proof against time, and the natural disinclination today of using paint for exposed work, although the Greeks established the precedent, can be overcome by the use of permanent Terra Cotta colors. The palette is practically unlimited.

The ancient Greeks used Terra Cotta. There is ample precedent for the use of Terra Cotta today if precedent is needed. Modern Terra Cotta is its own justification as the one material that consistently combines color with modeled form.



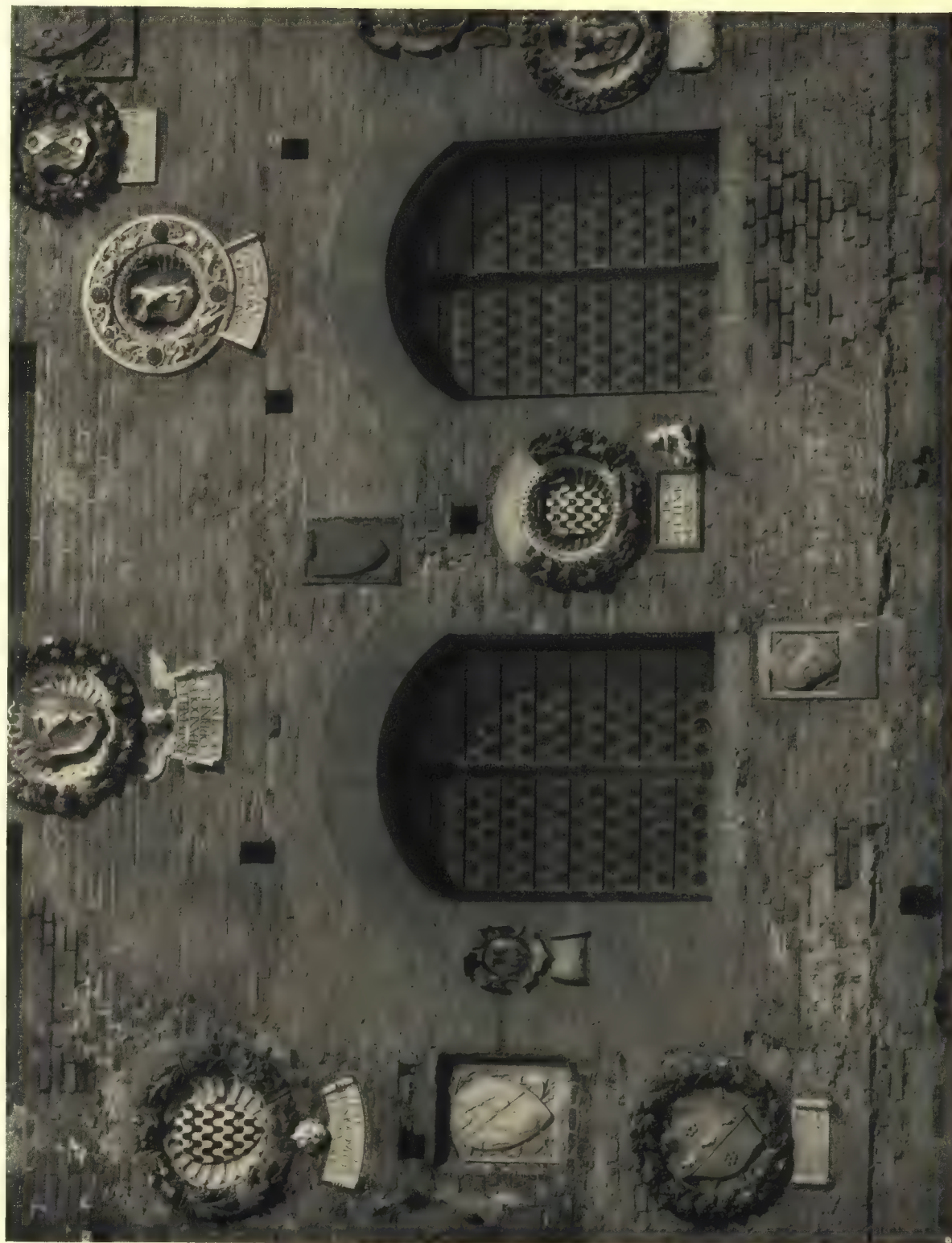


Plate XXXI—Atlantic Terra Cotta

Palazzo Pretorio. Certaldo, Tuscany

Polychrome Terra Cotta of the della Robbia School

Buildings of the Italian Renaissance period were frequently decorated with heraldic insignia in polychrome Terra Cotta. Generally introduced in a haphazard way they have little relation to the design, but the interest is apparent.





Plate XXXII—Atlantic Terra Cotta

Palazzo dei Diavoli—near Sienna

Armorial Bearings in Polychrome Terra Cotta

Touches of bright color near the top of a shaft of plain brick are particularly effective. Shields of the owners or the national seal have the added advantage of being entirely appropriate.



Plate XXXIII—*Atlantic Terra Cotta*

Church of S. Maria delle Carceri

Polychrome Terra Cotta was frequently used for church interiors. The frieze illustrated was executed by Andrea della Robbia and is typical of the della Robbia School. The date was approximately 1500.

Church of S. Maria Carceri, Prato





Plate XXXIV—Atlantic Terra Cotta

Church of S. M. Novella, Florence

Church of S. M. Novella, Florence

Polychrome Terra Cotta by Giovanni della Robbia, executed approximately 1510. Giovanni, the last of the three della Robbias, had at his command a practically unlimited range of colors and he used them with a lavish hand.





Plate XXXV—Atlantic Terra Cotta

Church della Osservanza, Sienna

L'Angelo Annunziante

The naivete of the Italian Renaissance is shown by the quaint naturalism of the figure work. Generally an attempt was made to show the color of the hair and the eyes. The figure is by Andrea della Robbia; the folds of the drapery are characteristic of his work.

Atlantic Terra Cotta Construction

Water-Proof Joints

Plate 11

In the construction of buildings there is nothing that is of more importance than the permanence of the exposed mortar joints in the upper surfaces of the different architectural features. If the walls and parapets are to be kept dry, the mortar joints in the wash of the sills, belt courses and copings, must be made water-tight and must be maintained in this condition. Impervious joints are obtained only by painstaking workmanship and the proper use of good materials.

Until recently, more effort was devoted to designing "weather-proof" joints than to investigation of actual weathering conditions in buildings. This led to wide adoption of several types of special joints. Some of these joints were admirable in theory, but in practice they did not produce the expected results. As usual, the human element had a most important bearing on the matter. Briefly, the result of devices to protect the joint was that masons and their supervisors rapidly lost interest in the condition of the mortar joint itself. Apparently they were under the false impression that when a special joint was used, it was unnecessary to make the mortar joint itself tight and impervious.

Roll or Covered Joints.

About fifteen years ago it was quite common practice to provide roll or covered joints on the washes of Terra Cotta courses; though no one thought of using roll joints on the washes of stone. Theoretically, covered joints looked like a good idea and they were used extensively until it became evident that from a practical standpoint they were very unsatisfactory.

It was found that roll joints were defeating the very object for which they were designed. Instead of being water-tight, they were usually the reverse. The average life of the pointing under the lap was only about two years. Investigation brought out the fact that vertical joints below roll laps were seldom filled with mortar and when the pointing disintegrated, or was pushed out by frost a gaping joint was exposed, inviting the entry of rain and snow.

There were several reasons for the open condition of the vertical joints beneath the roll covers. One was that the lap prevented the mason from cramming the joint from above after setting the Terra Cotta. Another reason was a psychological one. The mason, seeing a provision on the Terra Cotta to protect the joint, concluded that it was unnecessary for him to take the trouble to fill it properly with mortar. Thirdly, the lap cover made the inspection of vertical joints impossible.

In many cases, roll covers were broken by settlement or by expansion of the building, or split off by moisture freezing under them. They were also broken in handling. At the best, they were very ugly. Roll joints frequently conflicted with lips on the bottom of window frames, and it became necessary to either gouge out the bottom of the frame or stop the roll lap against the

front of the frame. This produced some very leaky and unsightly conditions. Roll joints were abandoned without regret about twelve years ago.

Raised Joints.

As the use of roll or covered joints declined, the raised filleted joint came into favor. The theory was that only the water that fell directly on the joint could soak into it. This type of joint was very popular until the examination of a large number of buildings brought out the fact that the raised joint was of no practical value as a means of keeping water out. Like the roll joint, the raised joint is attractive in theory, but in actual practice it does not achieve its object. If all rain fell gently and fell straight down, it would be of greater value, but it is worthless as a protection against driving rain or dissolving snow.

Investigation of raised joints has shown us that in the majority of cases, work that has raised joints is poorly set, as regards the filling of the vertical joints with mortar. It is very evident that the presence of the raised joint has been made the excuse for poor mortar and poor workmanship.

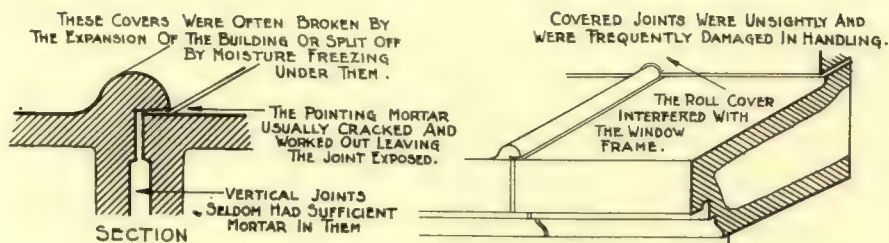
Raised joints were often broken by contraction and expansion strains in the building. They were easily chipped in handling. They were very unattractive in appearance. A few years ago, we became convinced that raised joints were of no value and we discontinued them.

Plain Butt Joints.

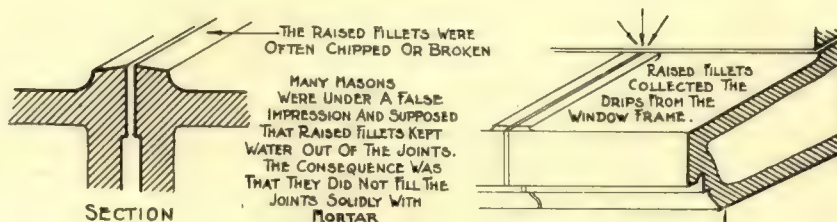
The important point, as we now see it, is not to try to keep the water away from the joint, but make the joint itself tight and impervious. Plain butt joints, exactly the same as the joints in stone work, are now used on the washes of Terra Cotta. They are neat in appearance and they cannot be damaged by strains in the building. Their chief advantage, however, is in the fact that they are just simple joints and do not create any false impression. When butt joints are used in either Terra Cotta work or stone work, the mason immediately realizes that it is necessary to pack the joints solidly with good cement mortar. He sees clearly that the weather tightness of the work depends entirely upon the quality of his materials and the thoroughness of his workmanship. With the plain butt joint, there is no obstruction to interfere with the execution of the work. It is our experience that butt joints are usually tight and well filled.

In this connection, it may be well to mention that mortar joints should be struck off and finished as the Terra Cotta is set. Raking out and repointing is worse than an unnecessary expense because the pointing invariably cracks and works out leaving an open joint to collect water.

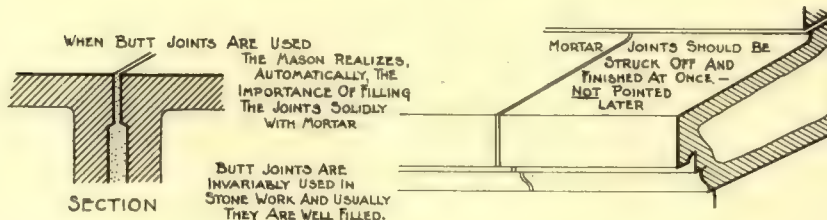
The Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta, issued by the National Terra Cotta Society, in September, 1923, and adopted by all members of the Society, eliminates all reference to roll or raised joints.



THE EARLY TYPE OF WEATHER JOINT.
KNOWN AS THE ROLL OR COVERED JOINT.
THIS PROVED A FAILURE AND IT WAS ABANDONED.



A LATER DESIGN. THE RAISED JOINT.
HAS NOT PRODUCED THE EXPECTED RESULT.
DISCONTINUED A FEW YEARS AGO.



THE MODERN METHOD. THE SIMPLE BUTT JOINT.
NEAT AND EFFECTIVE. PROVIDES NO EXCUSE FOR POOR
MORTAR AND POOR WORKMANSHIP.

DETAILS OF ATLANTIC TERRA COTTA CONSTRUCTION

THE PROTECTION OF JOINTS IN WASHES OLD AND NEW METHODS



Plate XXXVI—Atlantic Terra Cotta

Madison Square Presbyterian Church

Madison Square Presbyterian Church, New York

McKIM, MEAD & WHITE, *Architects*

Roman and Pagan in outline, Byzantine and Christian in detail, the Madison Square Church was the first polychrome work of importance to be erected in America. For many years it was the paramount example of polychrome Terra Cotta. A few years ago it went the way of its prototypes, but for a different reason. The site was needed for a sky scraper. Fortunately most of the polychrome Terra Cotta has been preserved. The pediment panel designed by H. Siddons Mowbray and modeled by Adolph A. Weinman is now on the Library Wing of the Metropolitan Museum of Art, New York. The main entrance is in the Brooklyn Museum of Art and Science. Other details are found on the Hartford Times Building in Hartford, Connecticut.

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Plant 3—Rocky Hill, N. J.

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ATLANTIC TERRA COTTA

English Tudor Terra Cotta
1522

VOLUME • VII • • MCM XX V • NUMBER • 7 •

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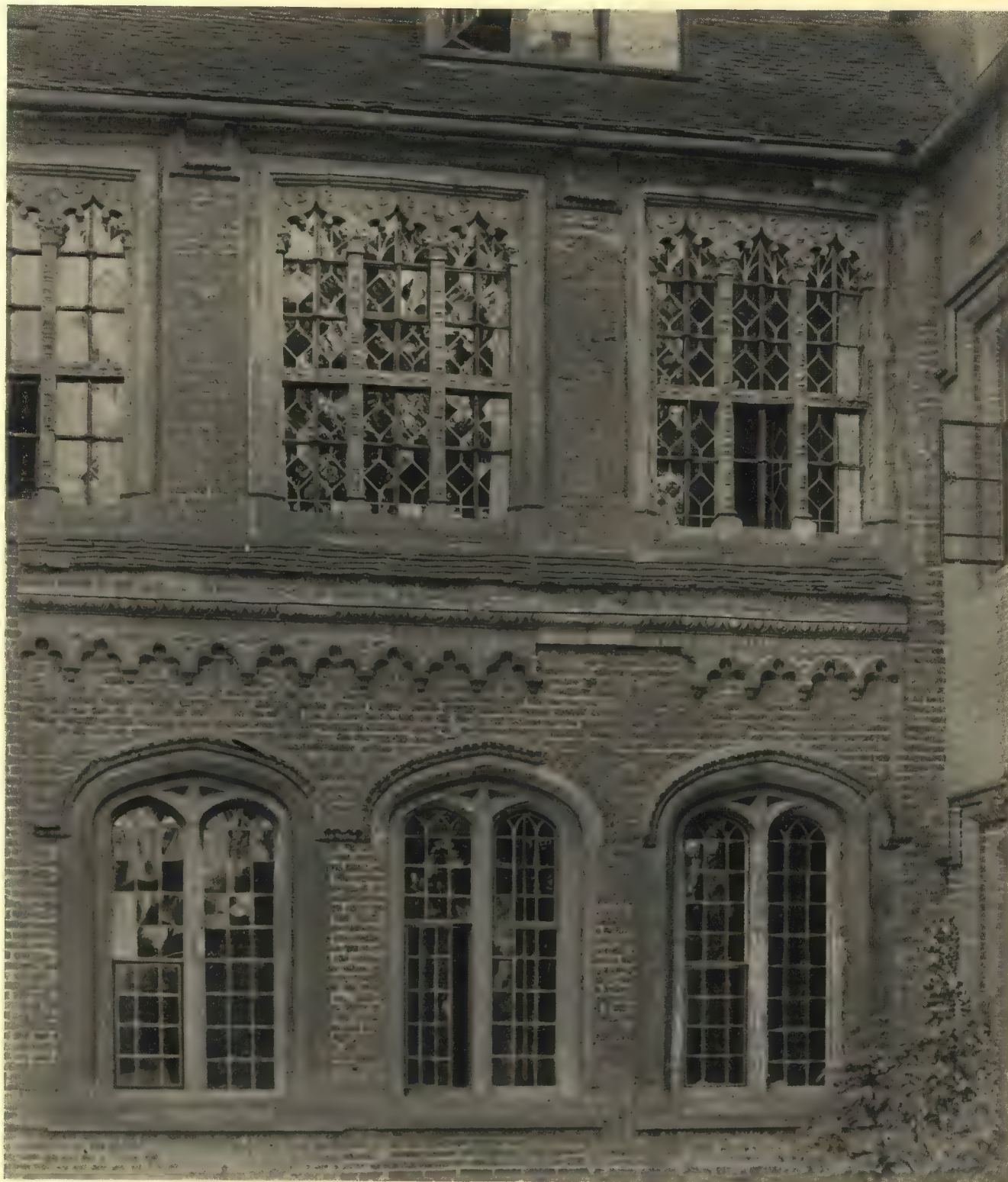
Plate XXXVII—Atlantic Terra Cotta

Layer Marney Towers, Essex, England

Layer Marney Towers, Essex, England

South side of gate house, showing the Terra Cotta treatment of the window heads,
Gothic detail of the facade and the Tudor cresting of the roof.





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Plate XXXIX—*Atlantic Terra Cotta*

Laver Marney Towers, Essex, England

Window Group, North Side of West Wing, Laver Marney Towers

The Terra Cotta trefoils are distinctly Gothic, but the window jambs, mullions and heads show an adaptation of Renaissance for a Tudor design.





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Plate XL—Atlantic Terra Cotta

Layer Marney Towers, Essex, England

Terra Cotta Detail of Window, Layer Marney Towers

The window shown on the measured drawing, on the next page.

Atlantic Terra Cotta Construction

Fluted Columns

Plate 12

Fluted columns, to be a success as an architectural feature, must convey an impression of massive strength combined with beauty of line and delicacy of detail. They must appear to possess ample strength to support the heavy entablature above them. They must have nothing about them that suggests crudeness or economy.

When fluted columns are properly designed and correctly jointed, the Terra Cotta manufacturer has no difficulty in producing the desired effect. When they are improperly jointed, it is almost impossible to produce creditable columns.

The accompanying drawing shows a badly jointed column in comparison with one that is designed and jointed properly. It is obvious that the bonded vertical joints in the flutes of the first example destroy the character of the feature. In the other example, with the concealed vertical joints, the effect of massive drums is produced and the column retains its full dignity.

Fifteen or twenty years ago the bonded jointing was the usual method, but fortunately, there are now only a few architects who still prefer it. The improved method of jointing fluted columns is now accepted as standard practice by the leading architects. Those who have used both methods never return to the old-fashioned bonded joints.

Another mistake that was made in the past was the attempt to make pieces with five or six flutes on them and expect all fillets to take up perfectly. This resulted in columns with irregular lines, uneven joints, and a very second rate appearance. Architects now understand that it is best to arrange the joints so that there are only three or four flutes on each piece. In these comparatively narrow pieces there is very little variation in shrinkage and not much opportunity for warping in the kiln. Consequently, the alignment of the flutes and fillets is almost perfect.

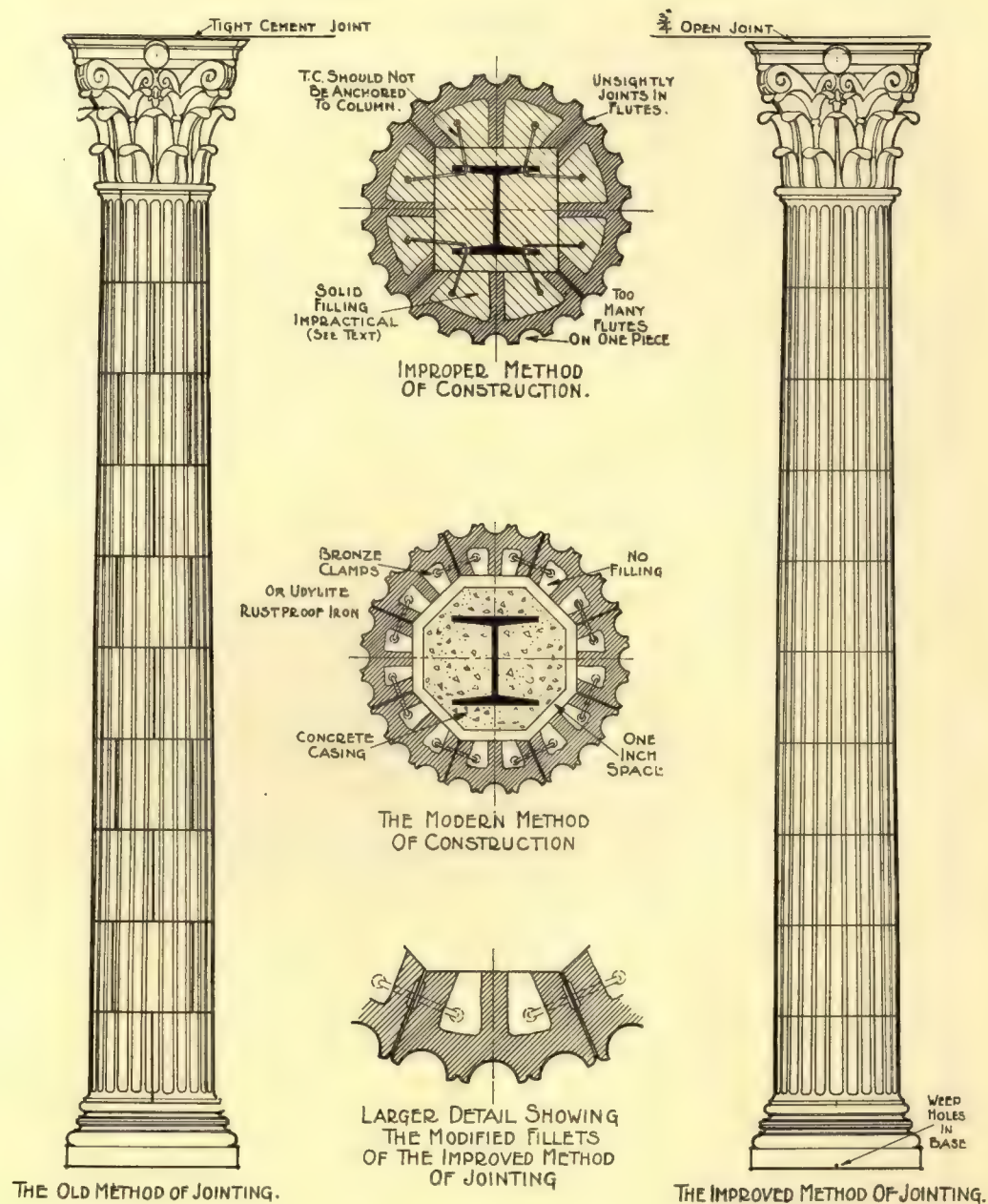
The detail near the bottom of our drawing shows the modified fillet that is used to conceal the vertical joints. This type of fillet not only conceals the joints; it also adds refinement to the lines of the column. Other types of modified fillets have been used but the design illustrated looks the best and produces the nicest results.

The interior construction of Terra Cotta columns is another important matter. The voids in the Terra Cotta should not be filled. We frequently receive architects' drawings that show solid filling, and specifications that insist on this method of construction. To fill the small irregular voids in the back of the Terra Cotta, solidly with brick masonry, is practically impossible. Grouting the voids leads to damage due to chemical or thermal expansion of the grout. Moreover, solid filling, forming a rigid connection between the core of the column and the shell, frequently transfers to the Terra Cotta the load that should be carried by the core and results in damage of some kind.

The pieces of Terra Cotta forming the drums should not be anchored to the central steel column or core, especially where only a concrete core is used. Concrete contracts in drying out and cores and columns often settle unevenly. The best practice is to use a stiff steel column to sustain the superimposed load and encase it in concrete, to prevent rust, leaving a one inch space between the back of the Terra Cotta and the face of the concrete covering. The pieces of Terra Cotta should be clamped together, using small Udytited iron or bronze clamps. Each course of Terra Cotta will thus form a ring or hollow drum; the facing material will fulfill its function as a facing and the structural core will take care of the load above.

The modern open method of construction not only allows contraction and settlement to take place in the core without damaging the Terra Cotta facing but also permits drainage and ventilation throughout the entire feature. Thus, staining and other results of saturation are avoided. Modern Terra Cotta columns are made with weep holes in the base to let out any water that may get in at leaky mortar joints.

Architects should always specify that the mortar joint above the cap of columns and pilasters is to be about three-quarters of an inch wide and is to be raked out and pointed with nothing harder than elastic cement. The use of hard cement pointing above caps has sometimes resulted in the shearing of abacus mouldings due to the cement delivering the weight from above to members that were intended for decoration and were not designed to carry loads.



DETAILS OF ATLANTIC TERRA COTTA CONSTRUCTION.
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Plate LXII—Atlantic Terra Cotta.

By Leon V. Solon.

Atlantic Terra Cotta Colors, Italian Renaissance Design

Mr. Solon used as a basis of his design the Terra Cotta cornice of the Church of San Giovanni Parma, erected in the early part of the fifteenth century. The original is illustrated in Plate LXIII. The theory of color as applied to Italian Renaissance is fully explained in Mr. Solon's article on the following page.

ATLANTIC TERRA COTTA

VOL. VII

MAY, 1925

No. 10

Studies in Polychromy; the Renaissance

A Polychrome Treatment of the Cornice of San Giovanni in Parma

By LEON V. SOLON

Author of

POLYCHROME, ARCHITECTURAL AND SCULPTURAL; THEORY AND PRACTICE.*

THE rapidly increasing attraction which the use of color is exerting upon architectural imagination, renders it necessary that information be given upon this subject by those who produce structural material endowed with the capacity to contribute color to architectural effect. Many architects desire to develop polychromatic effect but recoil from the disadvantages which invariably attend artistic experimentation undertaken with a lack of precise information; others, equally uninformed, have plunged into color, with the result they have indirectly contributed to progress by erecting danger signals for the wary. In the creation of color effect a certain amount of elementary science is involved, as we are dealing with phenomena which control the ultimate issue; phenomena, natural or artistic, when manipulated by novices have a ruthless manner in behavior.

When choosing the cornice of San Giovanni for color treatment we have deliberately departed from the tradition of the Renaissance style, the dominant character of which was monotone. This style was originally developed under the misconception that its Greek prototypes had always been in the monotone condition in which they appeared in the sixteenth century; there was little available data as to their original condition, save in sparse writings of ancient writers who treated the subject casually with considerable poetic license.

In all the polychromatic styles the basic principles which the Greeks advanced to such completeness are intuitively recognized. Structural dissimilarity, however, prevents the complete application of Greek method to Renaissance practice, but their technique in the mutual relation of colors upon ornamental detail is applicable in every emergency, even when the conformation of some detail is without counterpart in ancient structure.

The great vogue which the Italian manner of the sixteenth and seventeenth centuries has enjoyed of recent years throughout this country, is rapidly exhausting its capacity for stimulating advantageous reactions in the visual impression of our population. It is so admirably fitted for structures contrived for specific social and commercial functions that the continuance of its popularity as the "appropriate" style seems assured; with the introduction of polychromy in its development for modern problems, there is an opportunity for creating a quality of impressiveness and a scenic value which should assure artistic and material advantage. There is no canon of taste involved in the abstinence of the Renaissance architects from color in the exterior of buildings which decrees that the architect of today should tether and stake himself within that prescribed sphere defined by archaeological precedent should he visualize the opportunity to augment structural beauty through polychromy;

*Published by the F. W. Dodge Co., 119 West 40th Street, New York City.

the achievement of beauty in Art has always justified the means utilized, regardless of historic precedent.

The ultimate success of studies of this character depends in great measure upon the systematic manner in which color is planned upon assembled detail; the main difficulty which inexperience encounters consists in co-relating the degree of prominence which a colored member acquires, to its relative architectonic significance. In coloring a structural combination such as a cornice it is essential that no item of secondary importance takes visual precedence of any of major significance through undue color accentuation. A fundamental rule of polychromy decrees that colors be so grouped upon individual members, that each retains its distinct identity and separateness in the entity of effect; any arrangement of colors upon adjoining members which tends to associate, also, details making contact, when treated with the same color, produces a composite form of unforeseen character which has no architectural meaning.

In developing this study a definite procedure was followed in locating color upon detail, as follows:

1. The first color to be located was that which possessed the maximum degree of chromatic activity, viz, the vermillion.

2. That color which contained the maximum capacity for contrast, viz, the black.

3. As gold plays a very important part by reason of its contrasting texture and reflective brilliancy, it came next in order.

4. The remaining colors were distributed with the aim to combine those already located in the most advantageous manner, and to maintain the architectonic relation of each member.

We feel it superfluous to enlarge upon the obvious advantages which could be derived from the introduction of polychrome effect in the decorative features of limestone and brick structures; this fertile imaginative field may safely be left to the architect.

There is no medium for effect which holds so much promise in architectural design as polychromy, or which has been so little exploited in the attainment of that much desired asset—structural individuality. The former limitations of the Terra Cotta palette were serious obstacles to the proper use of that material in buildings of serious architectural pretension. The colors shown in our illustration, and many others, are all available, so that the architect may rest assured that his dreams can be materialized.

LEON V. SOLON.

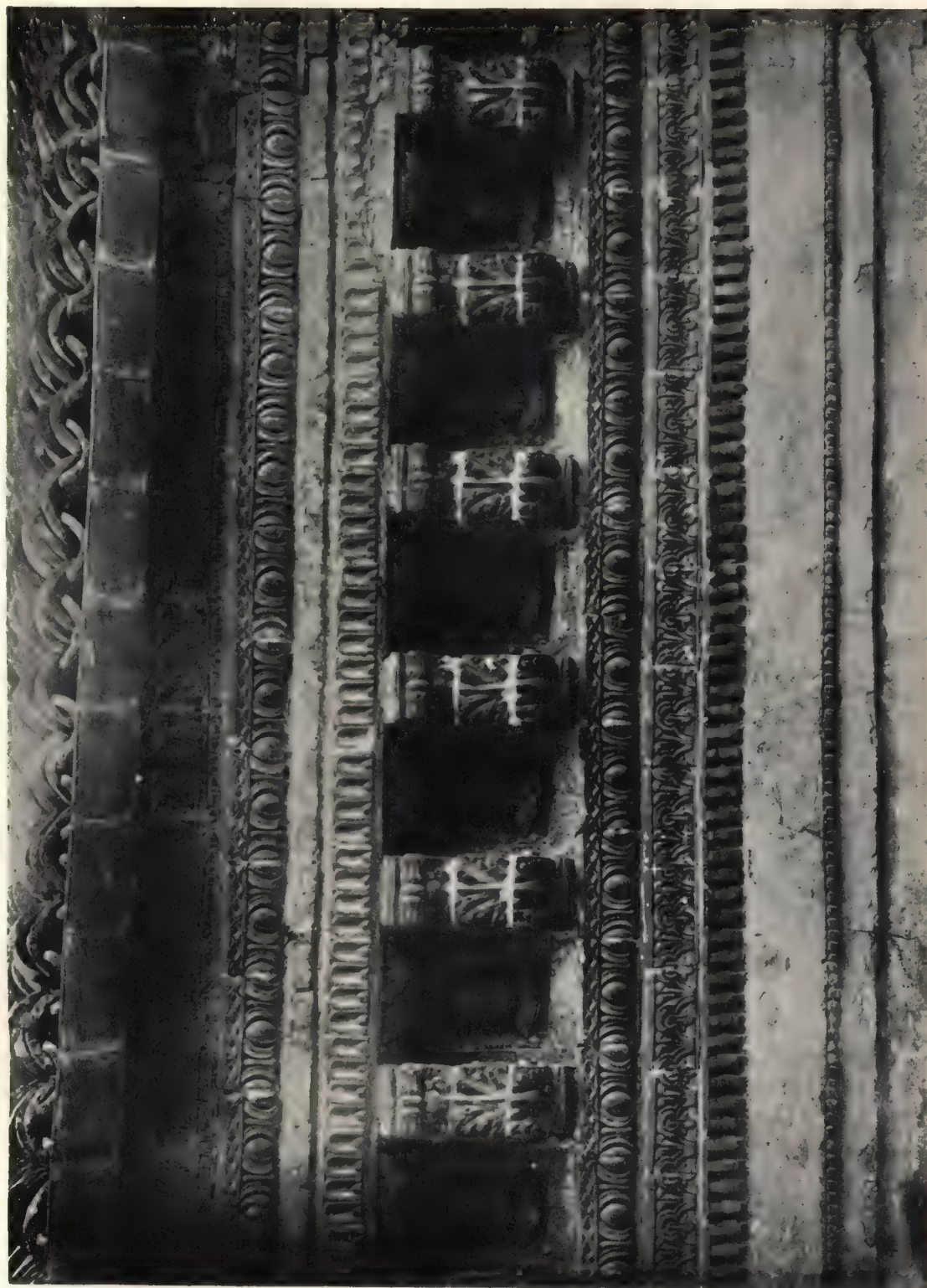


Plate LXIII—Atlantic Terra Cotta.

The Church of San Giovanni Parma.

The Prototype of Mr. Solon's Color Development

The Church of San Giovanni, Parma, was erected early in the fifteenth century shortly before Lucca Della Robbia completed his successful experiments to produce colored Terra Cotta glazes. The cornice is Terra Cotta in natural clay color.



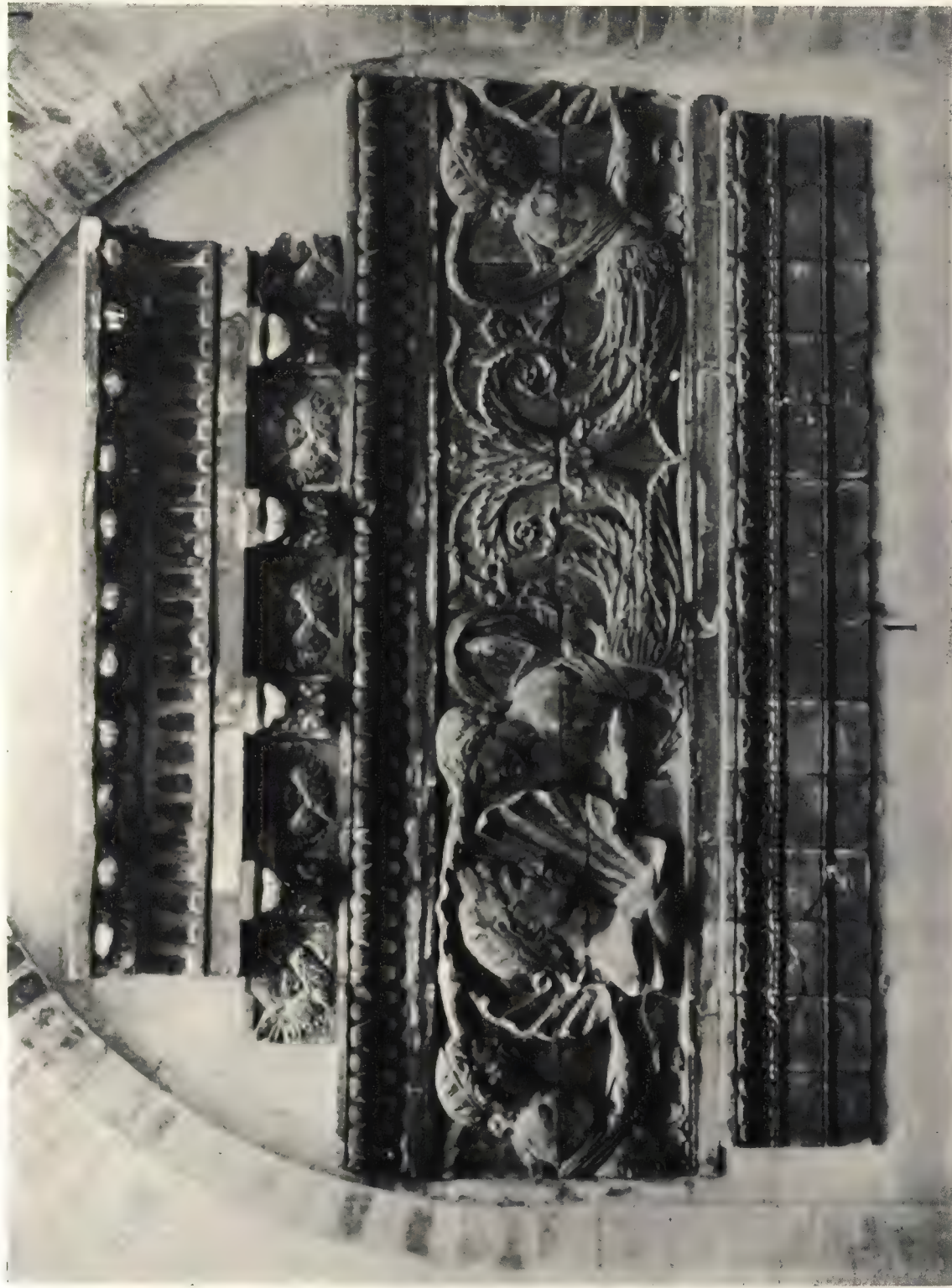


Plate LXIV—Atlantic Terra Cotta.

Terra Cotta preserved by Bologna Museum.

A Renaissance Cornice Well Adapted for Color Treatment

The cornice illustrated offered a splendid opportunity for treatment in colors with ample flat background and clearly defined detail in relief. Terra Cotta cornices occur in Italy in several places, including the Courtyard of the Palazzo Bevilacqua and over the Arcade of the Church of San Giacomo, both in Bologna.





Plate LXV—Atlantic Terra Cotta.

Arcade and Cornice, Certosa of Pavia, 1396-1491

Another example of an Italian Renaissance Terra Cotta cornice that could be effectively developed in colors, after the manner of the Della Robbias.

Certosa of Pavia.





Plate LXVI—Atlantic Terra Cotta.

Madison Square Presbyterian Church, New York.

Modern Polychrome, Madison Square Presbyterian Church New York

McKIM, MEAD & WHITE, Architects.

The adaptation of Byzantine detail to a church in Roman outline is an example of polychrome Terra Cotta that has never been surpassed, although it was the first important building to use Terra Cotta colors after a lapse of nearly four hundred years. The design would have been effective in monotone, but in polychrome Atlantic Terra Cotta it reached the highest point of effectiveness. The balcony and the column capitals are also in Atlantic polychrome. Unfortunately the building was taken down a few years ago. The Terra Cotta has been preserved in part by the Metropolitan Museum of Art and the Brooklyn Museum of Art and Science, and much of it was used in the construction of the Times Building, Hartford, Connecticut.





Plate LXVII—Atlantic Terra Cotta.

Royal Italian Embassy, Washington, D. C.

Royal Italian Embassy, Washington, D. C.

WARREN & WETMORE, Architects.

It is particularly appropriate that Terra Cotta should have been used for the cornice of the Royal Italian Embassy as it follows Italian precedent. In this case the walls are of Travertine stone and the Terra Cotta cornice harmonizes with the stone in color and texture. In a case of this kind, where the building is exceedingly simple in detail and comparatively small in size, color would not have been appropriate. The natural high-lights and the shadows offer sufficient contrast.





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Bird Bath, No. Z-410

For some years the Atlantic Terra Cotta Company has manufactured Garden Pottery in strictly de luxe quality. The list includes Garden Jars, following early Florentine style, Table Standards, Bench Standards, Window Boxes, Sun Dial Pedestals in great variety. No attempt has been made to follow modern styles. Everything dates back to an earlier period that has never been surpassed in either line or detail. As the originals were made in colors we are prepared to offer Garden Pottery in colors. We recommend especially Fieldstone Gray unglazed, Marble White matt glazed, Antique Green lustrous glazed. For formal gardens the marble white is particularly appropriate. For the informal gardens gray, red, buff or green are all appropriate.

The bird bath illustrated measures 3 feet 2 inches maximum height; the bowl measures 2 feet $1\frac{1}{4}$ inches in width, and $3\frac{1}{2}$ inches high. The pedestal is 2 feet $10\frac{3}{4}$ inches high. The base is 1 foot wide. The price is \$60.

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